FOUNDRY
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TRADE JOURNAL
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JACKMAN - BUILT OSBORN ROTA-LIFT MOULDING MACHINE

FOR MATCH PLATE PATTERNS

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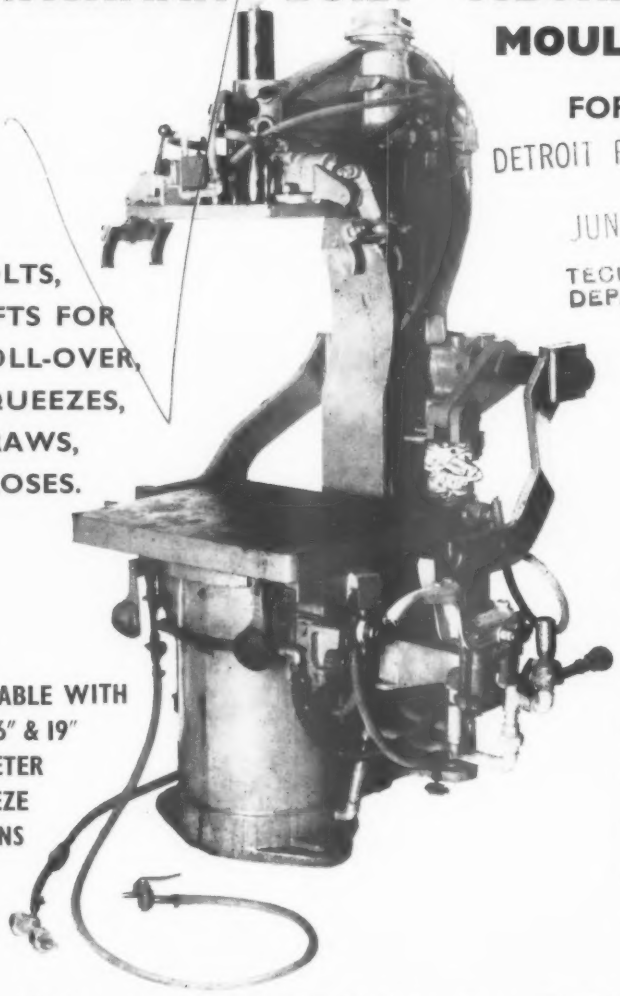

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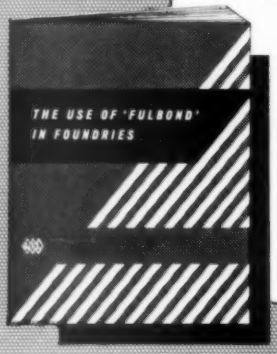
The working moisture content of moulding sands varies in accordance with their basic composition. For green sand castings some natural sands are mouldable at high moisture while others reach the optimum at an appreciably lower level. Fresh deliveries of natural sands which cannot be dried off, may compel foundrymen to use a moulding sand which has a moisture content exceeding that of the optimum. The result of this is low green strength, low permeability, the risk of dissolved gases in the metal leading to porous castings, and burning on. One solution is to add as much dry returned sand to the new wet sand as possible; the returned sand, however, may contain up to 75% of its original temper moisture.

FULBOND can be helpful because it has great capacity for absorbing water and also because of its effective bond strength over a very wide range of moistures. The small extra cost of the occasional use of FULBOND is more than compensated for by cleaner and sounder castings and time saved in the fettling shop. No amount of scraping, brushing and cleaning will produce the same skin finish on castings as a good and properly balanced moulding sand.



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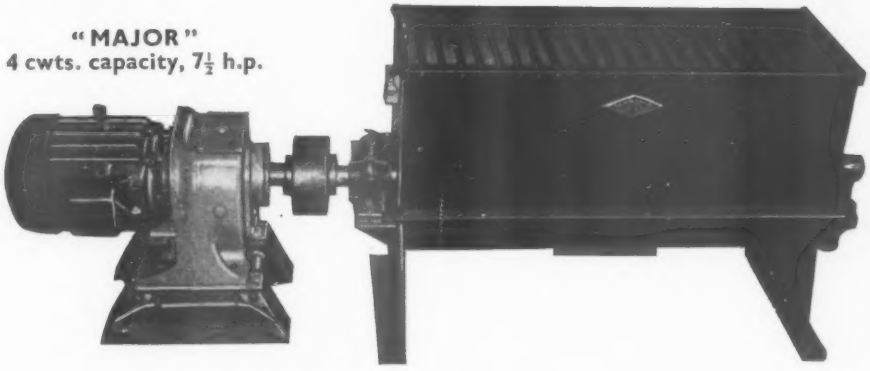
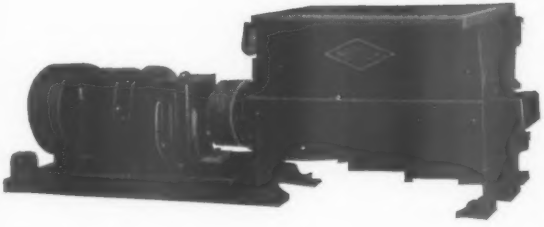
4 cwts. capacity, 7½ h.p.





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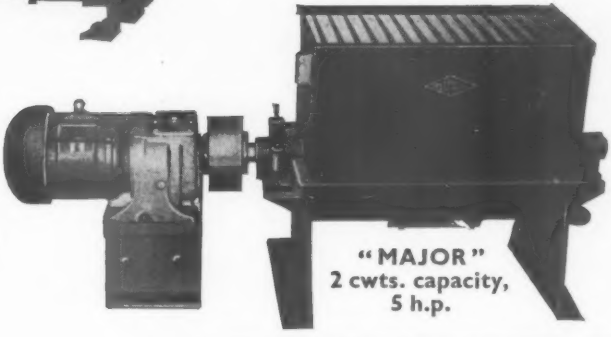

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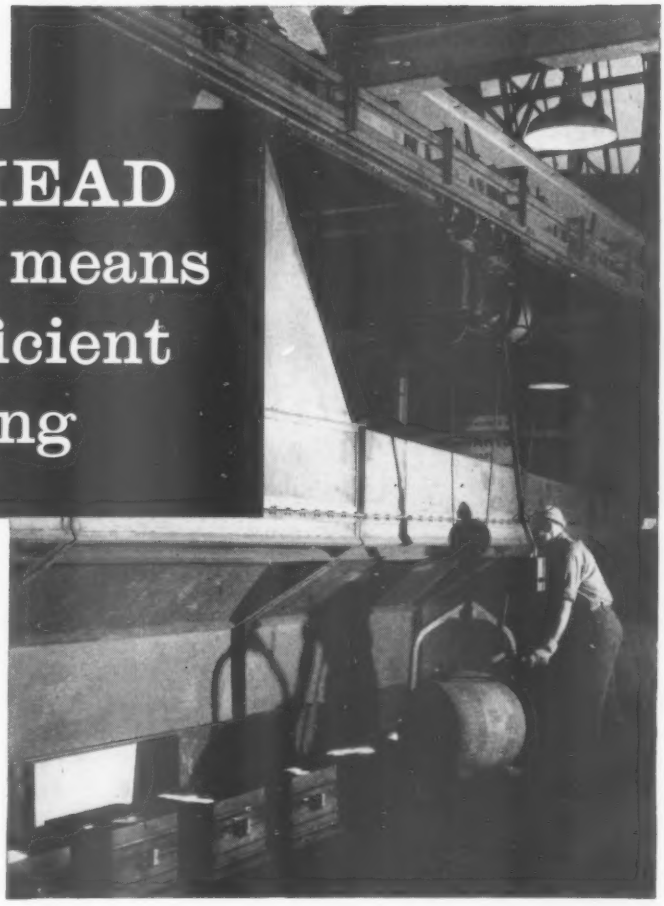
OVERHEAD handling means more efficient pouring



An overhead handling system from British MonoRail Limited means more economic, smoother pouring at the Derby foundry of The Leys Malleable Castings Company Limited. On the right an operator pours molten metal into moulds on a moving conveyor from a 500 lb ladle slung on a MonoRail track. The trolley and electric hoist on the track are moved by a power driven chain synchronised with the conveyor.

British MonoRail Limited have engineered many such safe and economic foundry handling systems for processes ranging from pouring to fettling—manually operated, power driven or remotely controlled. They also supply low headroom long span underslung bridge cranes with up to 5 tons capacity as part of complete overhead handling systems across or beyond a factory floor.

Some MonoRail advantages All materials and track are especially developed for the job. Rubber-tyred drives eliminate track wear. Standard track flange width. Wide range of interlocks, switches and lifts to provide outstanding flexibility.

A complete handling system. The MonoRail overhead system can be tailored for the needs of almost every industry, to make the most of floor space, and speed production processes and materials handling.

After a survey of your plant, we produce a tailor-made plan. This and the estimate are free.

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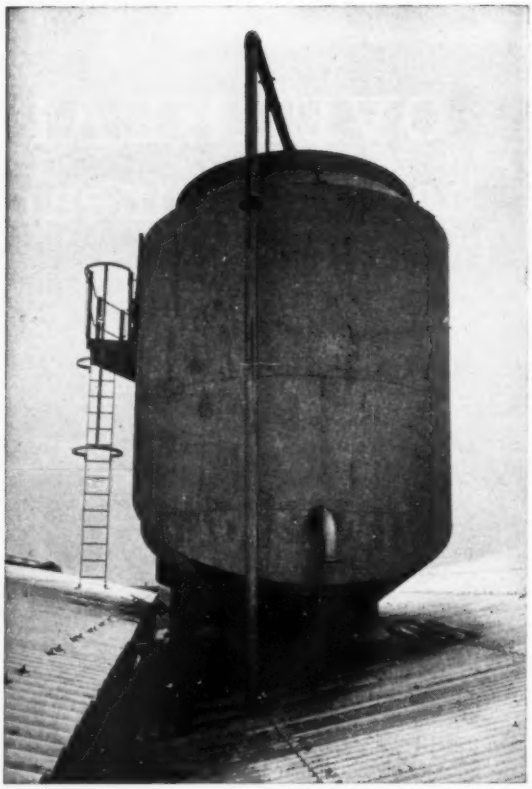

Designed by experts—the example shows the simple but scientific approach to a vital problem.

Photographs by courtesy of
BILSTON FOUNDRIES LTD.

Above:

View showing Wet type Spark Arresters with Inspection Platform serving 17-ton per hour Cupolas.

Left:

This highly efficient Spark and Dust Suppressor is provided with a Spray Jet giving double water curtain as illustrated.

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FOUNDRY EQUIPMENT ENGINEERS

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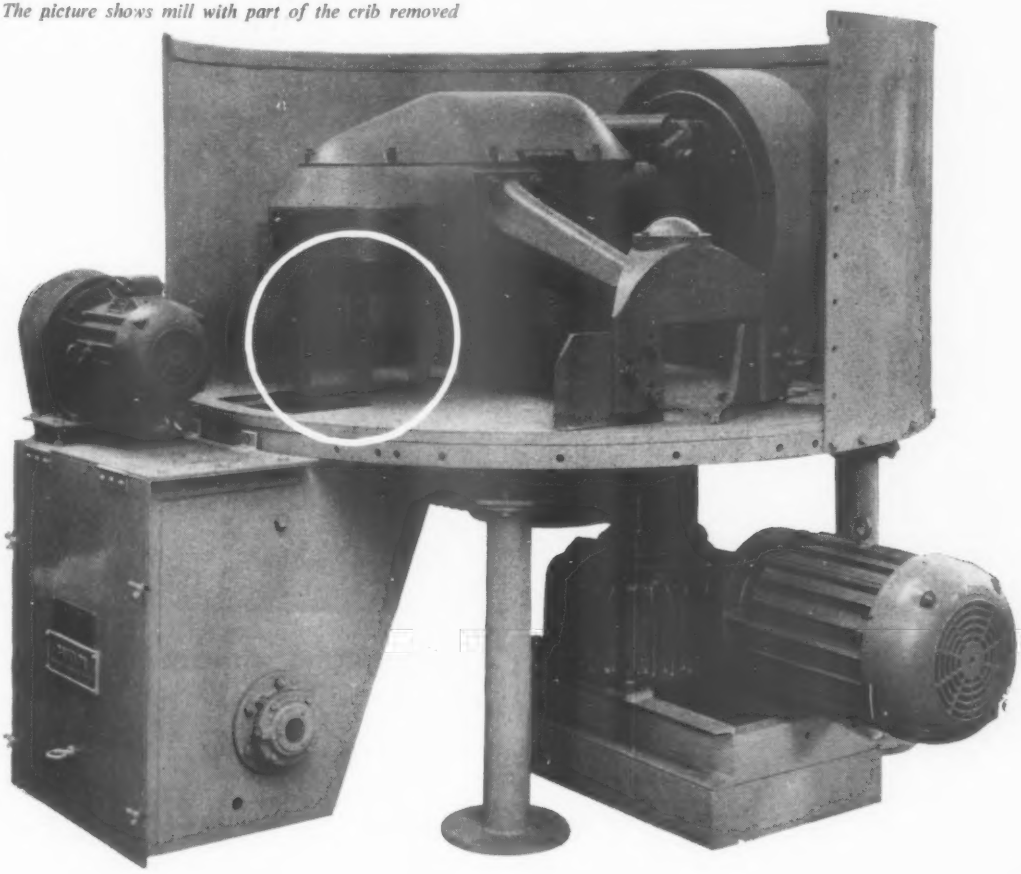
J.J.M.

This is our new 6 ft. mixing mill with the positively driven stirrers. A similar design will be available shortly in 4 ft. 6 in. dia. pan size.

The picture shows mill with part of the crib removed



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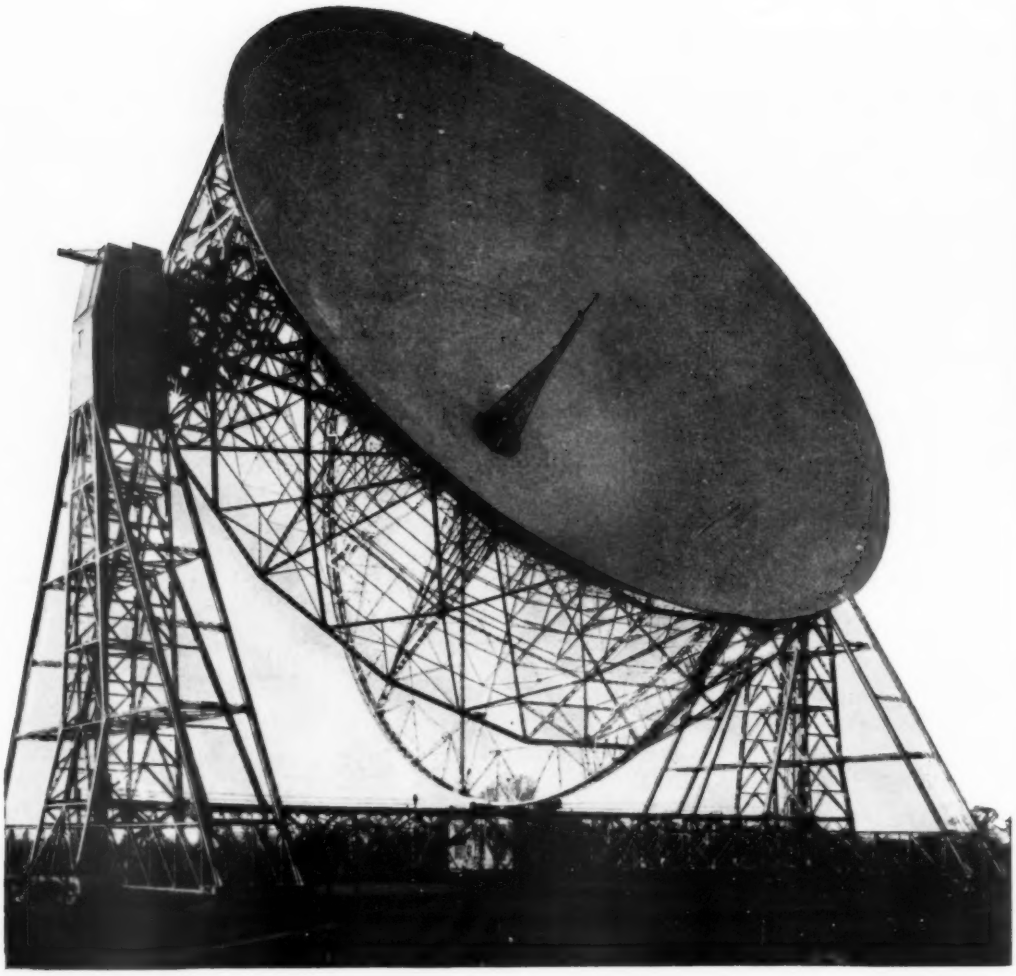

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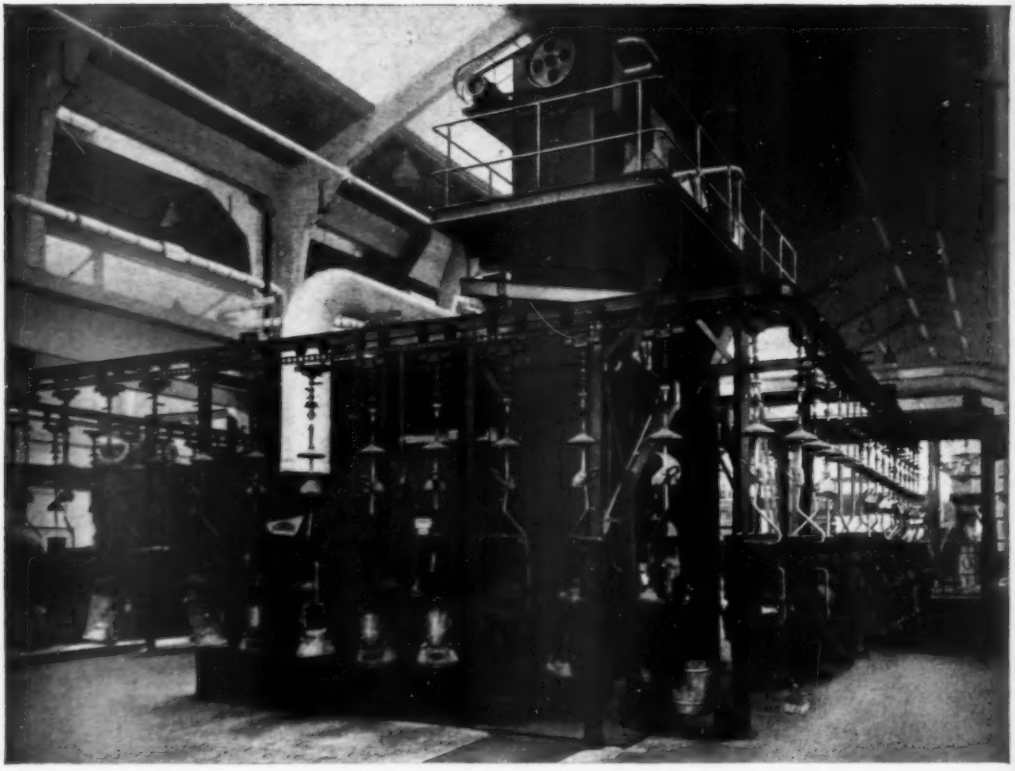
Overhead Monorail Conveyor Cleaning Plants

at Sterling Metals Ltd., Nuneaton



The illustration shows one of two overhead monorail conveyor cleaning plants installed at Messrs. Sterling Metals Ltd., Nuneaton. The machines are engaged in cleaning automobile component castings which pass through the 23ft. by 13ft. 6in. by 10ft. high cabinet and are thoroughly blasted by four centrifugal shot blast wheel units.
Tilghman's are experts in building shot cleaning plants for every type of work, and would be pleased to advise you on any application. Consult us about that special plant for your particular problem.

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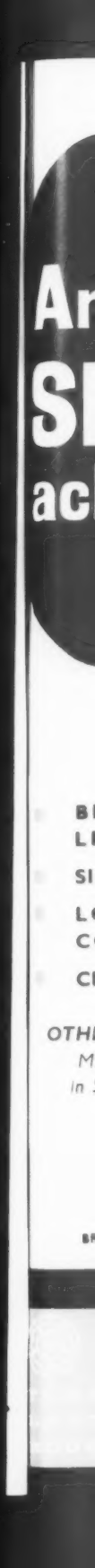
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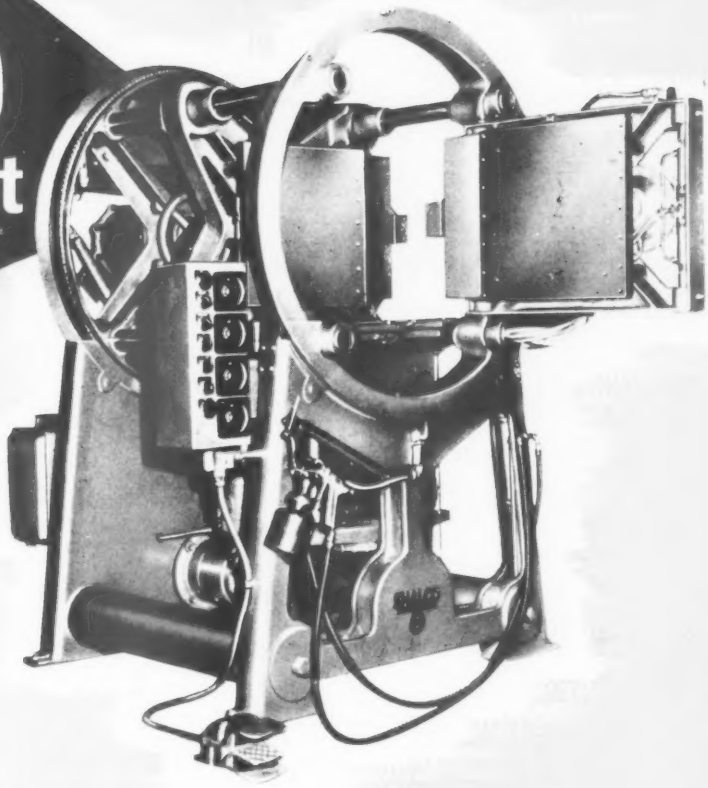
The U180

Semi-automatic SHELL CORE BLOWER

Another SHALCO achievement



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- LOWER COST PER CORE.
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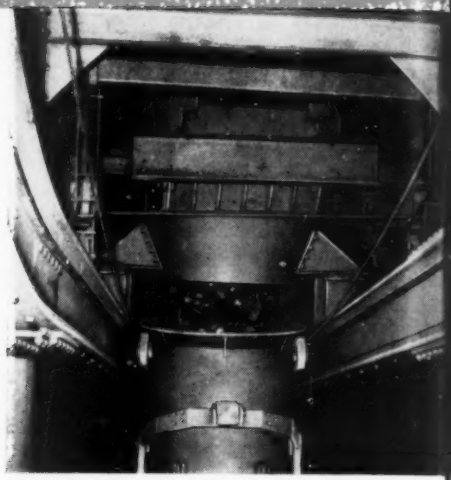
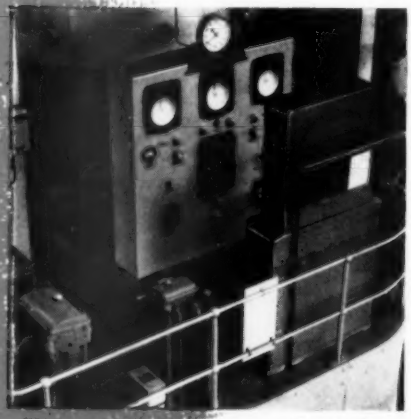
Headwork of swivel charger with power traverse for two 20-ton-per-hour cupolas.



Materials from floor weigh hopper discharging into a drop bottom bucket of swivel charger serving two 12-ton-per-hour cupolas.

Drop
cupola
above
locked
safety

(*Below*
ceiver
cupola



Control panel for two 10-ton-per-hour cupolas.

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These features are described in greater detail in four new leaflets. Tick those which you would like to receive and pin this coupon to your letterheading.

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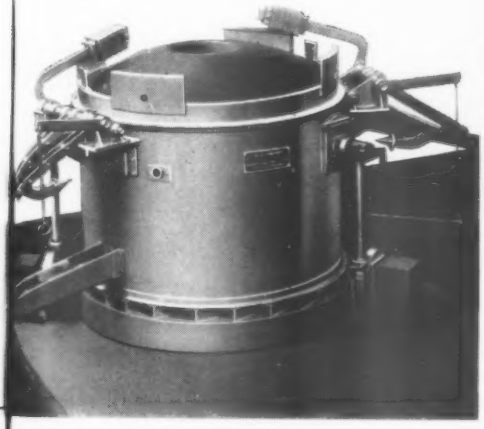
FOUNDRY PLANT

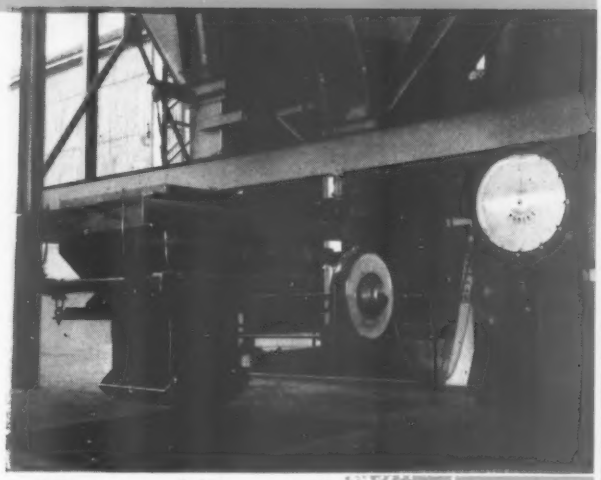
Telephone: Smethwick 21

Completely mechanized melting plants by INCANDESCENT

Drop bottom doors for a 35-ton cupola. These doors, which are 11 feet above floor level, are actuated and locked hydraulically. Hand operated safety bolts are provided.

(*Below*) 15-ton oil-fired stationary receiver for a pair of 20-ton-per-hour cupolas.





Coke and limestone weigh hopper with automatic feeders and weigher for two 20-ton-per-hour cupolas.

(*Below*) Coke hopper, floor weigh hopper and stock bins, for swivel charger serving 8-ton-per-hour cupolas.

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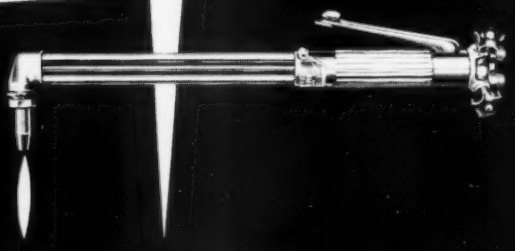

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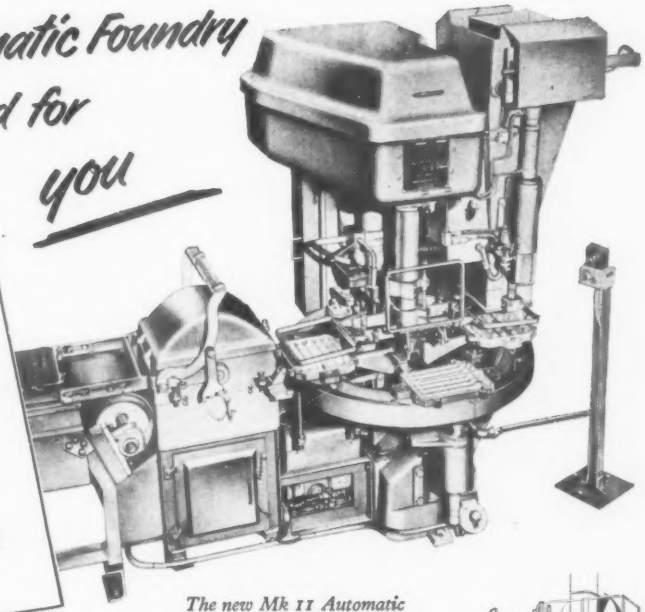
Do you make small castings?

Here is an Automatic Foundry specially designed for you

FOUR complete moulds in one minute



The new Mk 11 Automatic Moulding Machine.

The arrangement of the System is centred on one rotary moulding machine which performs automatically all the moulding operations, finally depositing the complete half mould on to a moving conveyor ready for assembly. From there, the only manual operations required are bringing the two half moulds together, guiding them into the rotary casting conveyor, metal pouring from a fatigue reducing mechanism and removing the mould and castings at the shake-out.

Note these outstanding features:

★ Automatic moulding eliminates all skilled operations and increases production.
★ Automatic sand reconditioning.
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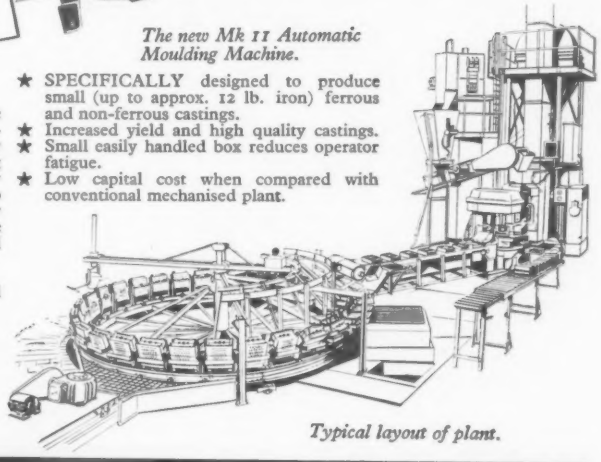
★ Economy of floor space (the complete plant only requires 60 ft. by 30 ft. approx.).

★ SPECIFICALLY designed to produce small (up to approx. 12 lb. iron) ferrous and non-ferrous castings.
★ Increased yield and high quality castings.
★ Small easily handled box reduces operator fatigue.
★ Low capital cost when compared with conventional mechanised plant.



Typical layout of plant.

It's the HALLSWORTH AUTOMATIC MOULDING SYSTEM

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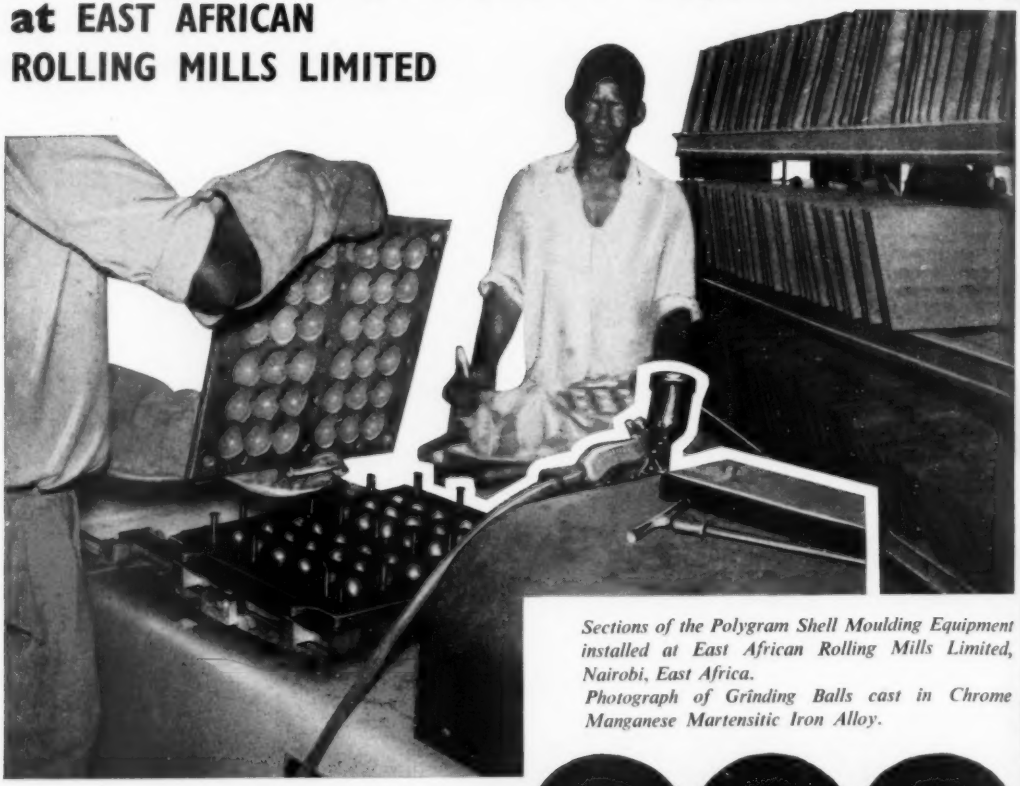

Sections of the Polygram Shell Moulding Equipment installed at East African Rolling Mills Limited, Nairobi, East Africa.
Photograph of Grinding Balls cast in Chrome Manganese Martensitic Iron Alloy.

East African Rolling Mills Limited produce large quantities of Grinding Balls for the Cement Works and Mines of East Africa. The Balls are cast in Chrome Manganese Martensitic Iron Alloy, and are vastly superior to the previously used forged steel. Production costs are considerably lower and African unskilled labour is used for the entire production.

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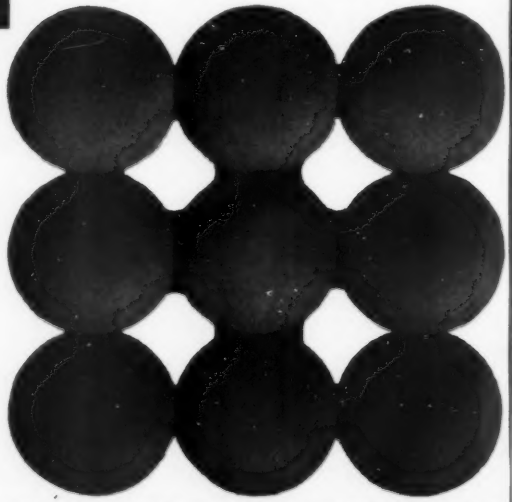
Polygram Casting Company have a competent and complete service to offer, and your enquiries are invited.



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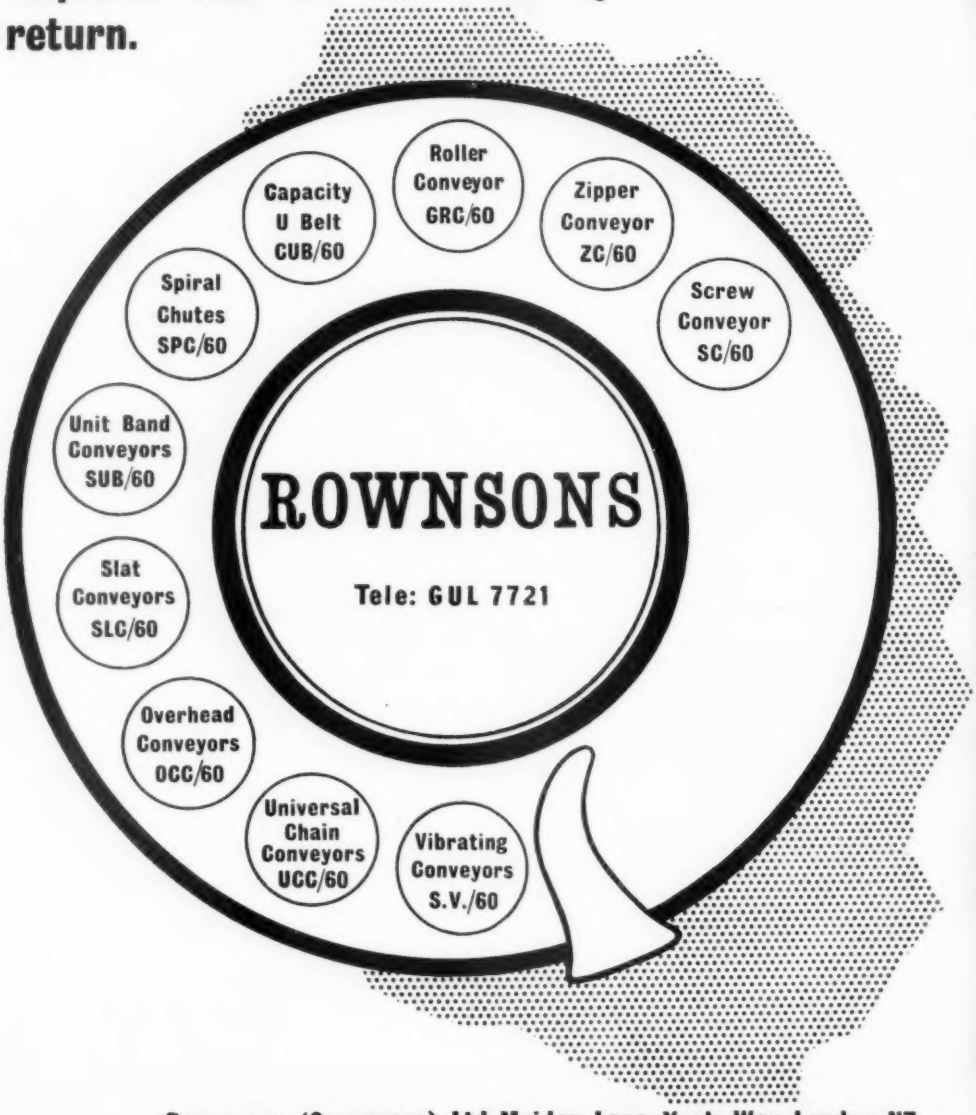
A telephone call will bring you any of our useful leaflets. Please quote reference numbers required and we will mail by return.



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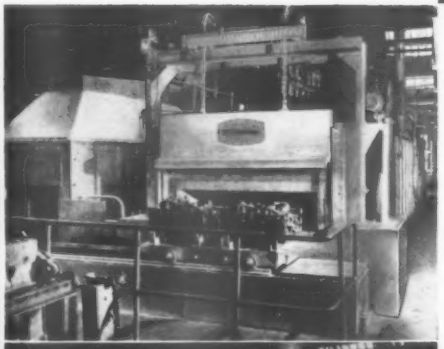
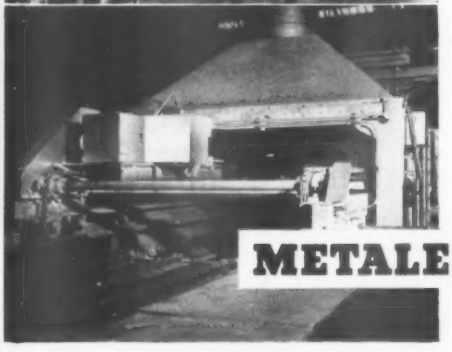
METALECTRIC

MALLEABLIZING CONTINUOUSLY

PEARLITIC AND FERRITIC MALLEABLE FROM THE SAME PLANT





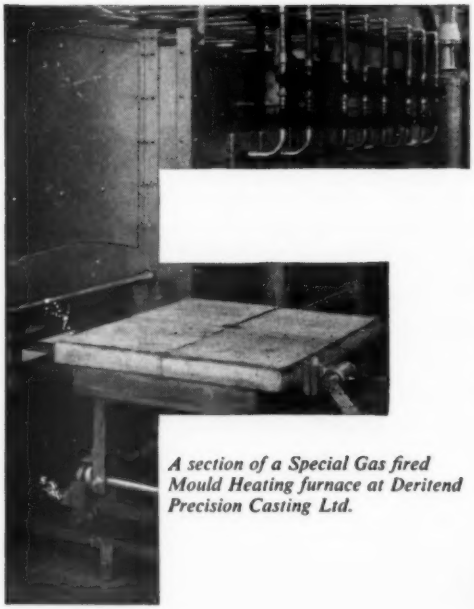
Equipment for continuously producing ferritic and pearlitic malleable has been in operation for over four years, and the Metalectric plant installed at the Dagenham Works of The Ford Motor Co. Ltd., provides ample proof of the reliability of this form of annealing. The high degree of anneal coupled with ease in handling and the provision of a completely automatic plant emphasizes the consistency and uniformity of results which can be obtained by this process. Subsequent installations in the course of manufacture for Gloucester Foundry Ltd. and G.K.N. (Cwmbran) Ltd., include more up-to-date features, providing the latest form of continuous annealing.

METALECTRIC FURNACES LTD.

SMETHWICK • ENGLAND

for all forms of electric heat treatment

5/33B/60



A section of a Special Gas fired Mould Heating furnace at Deritend Precision Casting Ltd.

FRANKLIN FURNACES

There's big savings in terms of dependability and easy maintenance when Franklin are called in on that furnace installation. Long experience in the supply of standard, and the design of special furnaces mean the snags are quickly ironed out. Furnaces fired by 'Dine' Burners give easy maintenance and fuel economy, that's why more and more well-known Companies are now counted as customers.
Our team of experts would welcome the chance to look into your furnace problems.

FRANKLIN

MANUFACTURERS OF INDUSTRIAL FURNACES AND OIL BURNING EQUIPMENT FOR ALL PURPOSES

FRANKLIN FURNACE CO. LTD., BAKER STREET, SPARKHILL, BIRMINGHAM 11, ENGLAND

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FERRO-ALLOYS

PRODUCED IN SOUTH AFRICA BY

AFRICAN METALS CORPORATION LIMITED

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HIGH CARBON FERRO-CHROME
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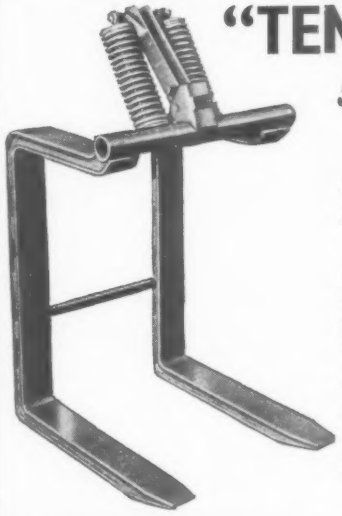
LIFTING APPLIANCES

TRIPLE GEAR CHAIN BLOCKS

SHORT HEAD-ROOM. Light weight. Compact and highly efficient. Capacities from 1 ton to 10 tons.



"TEMPLEWOOD"
SPRING-BALANCED CRANE FORK

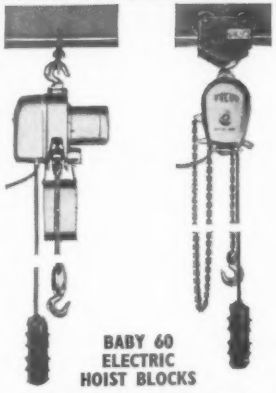
Faster. . . . Safer . .
More Manœuvrable . . .

A new concept in mechanical handling which replaces chains and 'C' frames. Can be used in gangways too narrow for fork-lift trucks—this means an increase of storage space of up to 50 per cent.

Available in a range of sizes and in capacities up to 5 tons.

RATCHET HOISTS

Incorporating a patented Overload Preventer giving greater security and safety to the operator, also reducing wear and saving cost of maintenance. A free - wheeling feature enables quick adjustment of unloaded chains.

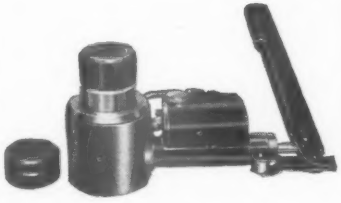


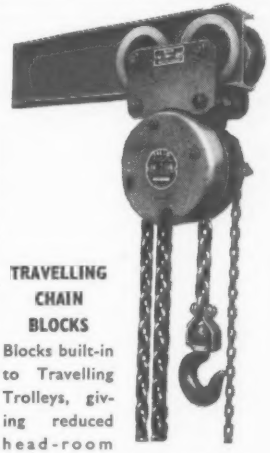
BABY 60 ELECTRIC HOIST BLOCKS

BRITISH MADE. Patents Pending. 5 and 10 cwt. capacity. Light weight, compact and portable. Pushbutton control. Upper and lower overtravel limit switches. Supplied for any height of lift to suit requirements. Top hook suspension facilitates attachment to travelling trolleys or girder clamps, etc.

LOW LIFT JACKS

Large capacity for use in confined spaces. Swaying under load eliminated by large diameter providing easy adjustment of height. Capacities from 10 to 30 tons.





TRAVELLING CHAIN BLOCKS

Blocks built-in to Travelling Trolleys, giving reduced head-room

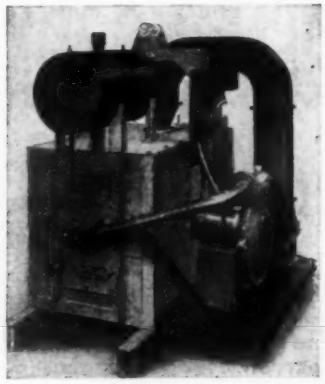
Capacities from 1 ton to 10 tons.

FELCO HOISTS LTD., 29 CROMWELL ROAD, SOUTH KENSINGTON, LONDON, S.W.7

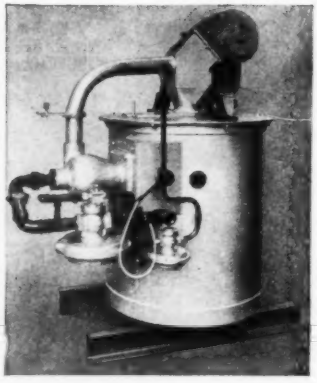
Phone: KENSINGTON 7401 (3 lines) *'Grams: 'FELCOHOIST,' WESPHONE, LONDON*

F2/60

Reduce operating costs with this *portable* mould dryer



OIL FIRED



GAS FIRED

"NEWSTAD"

PORTABLE MOULD DRYERS

Efficient	*Economical*
Reliable	*Self Contained*
Readily Portable	*Increase Production*
Reduce Operating Costs	*The ideal method of drying large floor moulds*
Built to withstand Rough Handling	*Safety devices to guard against gas and air supply failure*
Fitted with protective device to cut off oil supply in case of electrical failure	

Units designed for customer's specific requirements either gas or oil fired

MODERN FURNACES and STOVES LIMITED

Builders of INDUSTRIAL FURNACES

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8/219

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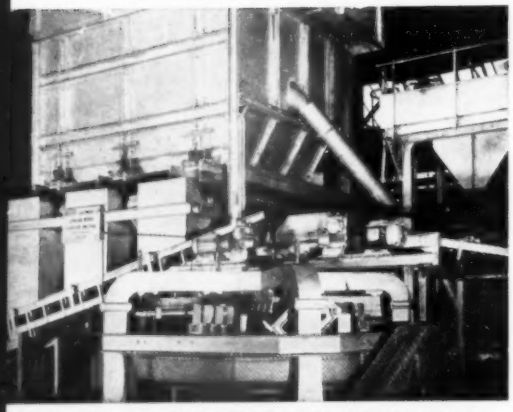
Solid flange which will not curl or crack . . .
solid rolled sections designed to resist all strains . . .
steel of special analysis . . . ensure long life in service

Sterling

STERLING FOUNDRY SPECIALTIES LTD., BEDFORD, ENGLAND

Cogent

F.E. 'KNOW-HOW



SIXTY TONS CAPACITY HOPPER DISCHARGE SYSTEM TO S.B.3 MILL (30 T.P.H.) FOR MULTIPLE SANDRAMMER INSTALLATION.

CONTINUOUS CASTING PLANT, USING F.E.2 AND F.E.3 HYDRAULIC UNDERSAND FRAME MOULDING MACHINES.

NO. 1000. AUTOMATIC SHELL MOULDING MACHINE, (SHELL SIZE 30" × 20")

F.E. is the symbol of Foundry Efficiency and is the hallmark of advanced foundry engineering and the modern rugged plant and machinery designed and manufactured by Foundry Equipment Ltd.

Formed in 1932 to supply specialised equipment to al foundries. Commenced manufacturing in 1934 and has maintained a continuous policy of research, design and development, manufacture and expansion. Is Europe's leading manufacturer of foundry equipment and currently exports over 50 per cent. of its production to the leading industrial countries of the world.

Our comprehensive catalogue or specific machine leaflets are available on request, and we shall welcome your enquiries. Our sales technicians will visit you to discuss any foundry problem. Our Works and Demonstration Foundry are always open to visitors, who are welcome at any time.

(Leighton Buzzard is 40 miles North-West of London.)

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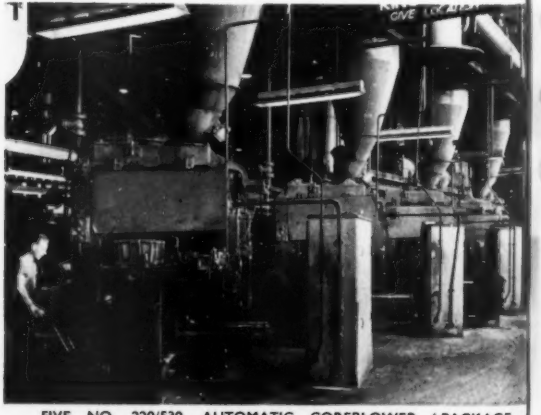
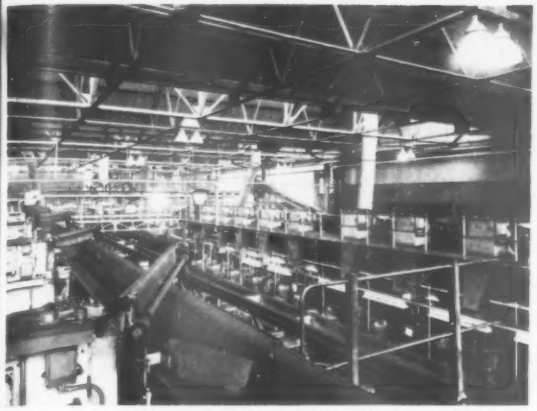


FIVE NO. 220/530. AUTOMATIC COREBLOWER 'PACKAGE UNITS' IN AUTOMOBILE FOUNDRY.

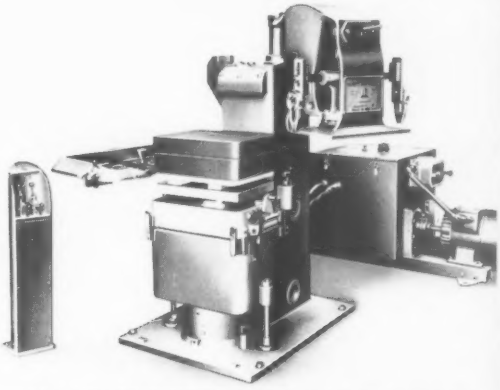


TWIN DISTRIBUTION LINES (WITH 16 AUTOMATIC ELECTRONIC PLOUGHS) ON 90 T.P.H. SAND PLANT FOR MALLEABLE IRON FOUNDRY

SENIOR NO. 2A. SANDRAMMER, FITTED HYDRAULIC POWER ASSISTANCE AND OPTIONAL REMOTE CONTROL.

DESIGNERS & MANUFACTURERS OF:

- Large Continuous Casting Plants.
- Semi-Mechanised Installations.
- Sandrammer Installations.
- Sand Mills (Batch and Continuous), Screens and Disintegrators.
- Sand Handling Plants (Conveyors, Elevators, Hoppers).
- Moulding Machines — Pneumatic, Magnetic, Hydroil-Electric and Hydraulic.
- Sandrammers—Impellor type.
- Continuous Platform Mould Conveyors.
- Knockouts, Pushers and Empty Box Return Equipment.
- Shell Moulding Machines and Shell Core Blowers.
- Automatic Coreblowers and Core Shop Equipment.
- Sand Dryers and Coolers.



H.E.B.I HYDROIL-ELECTRIC BOXLESS MOULDING MACHINE, MOULD SIZE 17" × 12" (OTHER SIZES 18" × 14" AND 22" × 16").

DUPLEX MOULDING AND CONTINUOUS CASTING PLANT FOR SEWING MACHINE CASTINGS (INSTALLED IN SPAIN).

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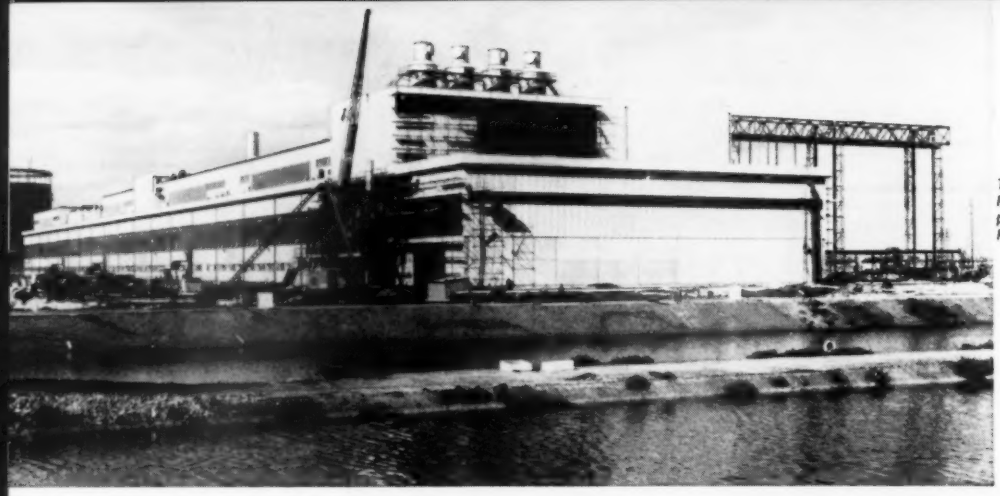
FOUNDRY EQUIPMENT LTD.

LEIGHTON BUZZARD, BEDFORDSHIRE, ENGLAND

TELEPHONE : LEIGHTON BUZZARD 2441 (5 lines)

TELEGRAMS : 'EQUIPMENT' LEIGHTON BUZZARD



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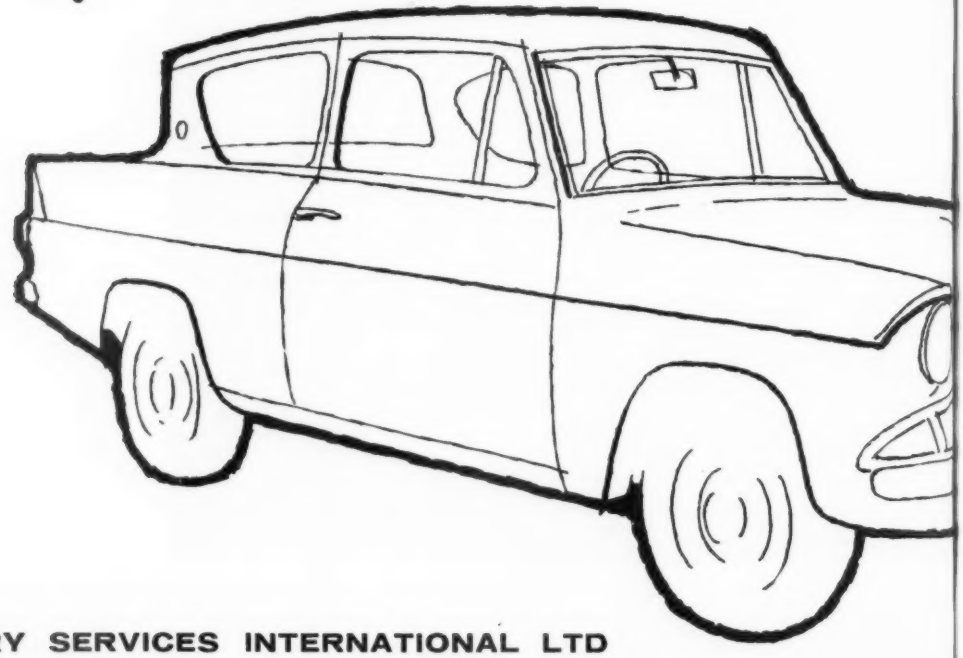
WORLD WIDE SERVICE FOR FOUNDRYMEN



FOUNDRY SERVICES INTERNATIONAL LTD

Long Acre Nechells Birmingham 7

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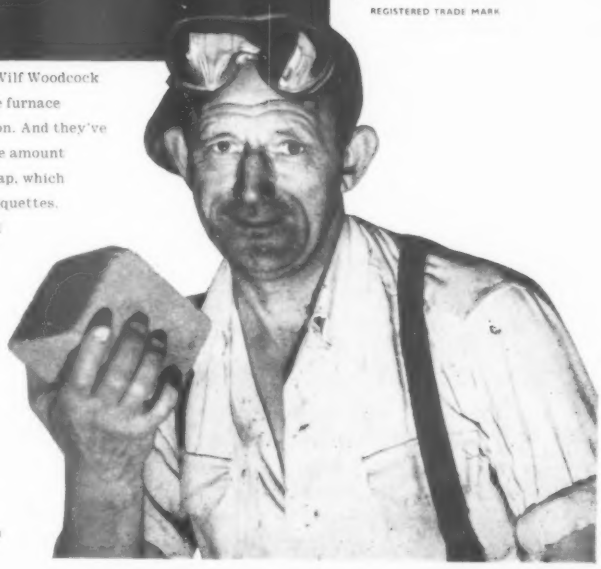
"These FERROCARBO* briquettes have certainly made a difference" says Wilf Woodcock.

* REGISTERED TRADE MARK

In the foundry at Mather and Platt Ltd., where Wilf Woodcock works, they use FERROCARBO briquettes in the furnace charges, mainly to save on the cost of the pig-iron. And they've been successful—as Wilf says, "We've reduced the amount of pig from 50% to 33%, making up with more scrap, which means that we more than save the cost of the briquettes. And the iron is beautiful. It's clean and has good fluidity—even with poor quality scrap—and they tell me that the machinability has improved, too."



CARBORUNDUM can help you

In most of the major industries of the world, CARBORUNDUM is helping top firms to make better products, to cut costs, and to speed production. In the sharply competitive climate of to-day, there are three main conditions for success: high quality, low prices and early deliveries. CARBORUNDUM can help you meet them all.

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Belliss & Morcom Ltd

makers of

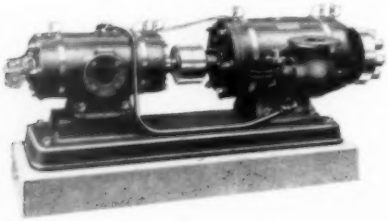
THE WORLD'S BEST COMPRESSORS

announce the

B & M

ROTARY COMPRESSOR

The result of thirty years' experience in design, development and manufacture, during which time many thousands have been installed on the Continent and in the U.S.A. These compressors are now being manufactured under licence in this country by Belliss and Morcom.



B & M Rotary Compressors are suitable for outputs from 100 to 600 c.f.m. and pressures to 110 p.s.i.g. They are equally suitable as vacuum pumps or as gas boosters and we will be pleased to advise you on the application of these versatile machines.

Belliss & Morcom Ltd

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Z

CUT COSTS of foundry fettling with

Zircosil

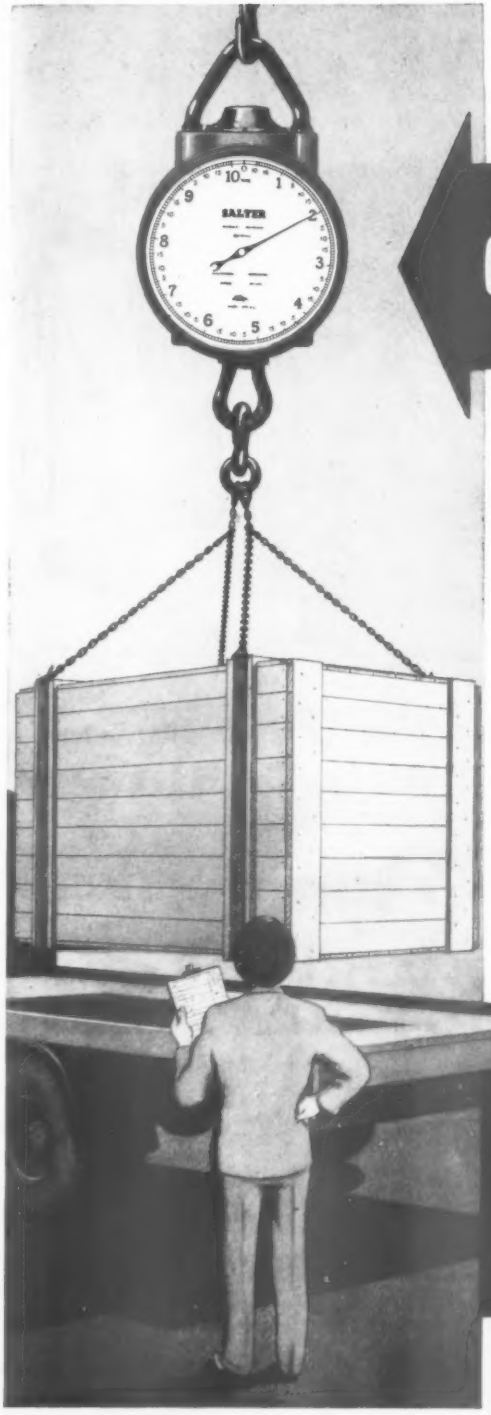
ZIRCON SAND AND FLOUR

ASSOCIATED LEAD

MANUFACTURERS LTD.

ZIRCOSIL

ZIRCON DIVISION, CRESCENT HOUSE, NEWCASTLE UPON TYNE, 1.



CUT LABOUR COSTS

LIFT, WEIGH and LOAD *in ONE operation*

The Salter Crane Weigher, available in many capacities between 10 cwt. and 200 tons, saves time, labour and expense. Attach it to the crane hook and lift, weigh and load *in one operation*. The clearly indicated weight is read at a glance—a quick and reliable method of weighing in the factory, foundry, dockside or railway yard, etc. Send NOW for illustrated literature detailing the capacities.

SALTER

THREE-IN-ONE CRANE WEIGHER

GEO. SALTER & CO. LTD., WEST BROMWICH

Established 1760

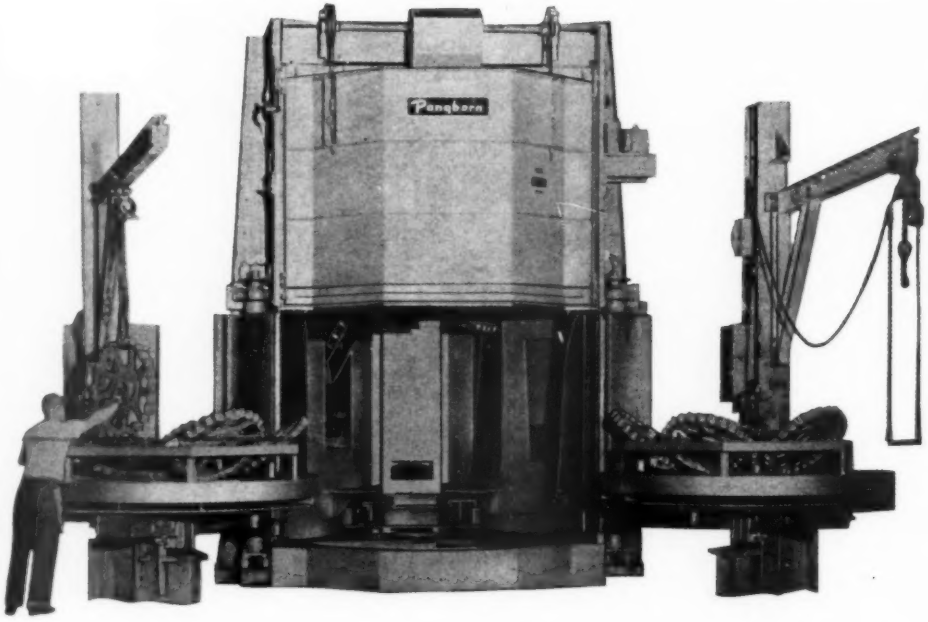


illustration of 8′ 0″ diameter
TWIN TABLE

MAXIMUM WORK

Machine	Dia.		Height		Weight
4 LM	4′ 0″	×	2′ 0″	×	2,000
6 LM	6′ 0″	×	3′ 0″	×	4,000
8 LM	8′ 0″	×	3′ 6″	×	10,000
8 LM-1	8′ 0″	×	5′ 0″	×	12,000

"Pangborn"

AIRLESS
SHOT BLASTING
MACHINE

with guaranteed 10,000 lb.
loading capacity each table

HEPBURN CONVEYOR CO. LTD.
WAKEFIELD

WARNER REFINED ALLOY PIG IRON

for High Duty Castings

- Clean machine cast pigs
- Nickel, Chrome, Molybdenum Vanadium, contents as required
- Guaranteed analysis within specified limits
- Complete uniformity
- Prompt delivery

"Pioneers of Refined Pig Iron"

WARNER & CO. LTD., MIDDLESBROUGH

KA

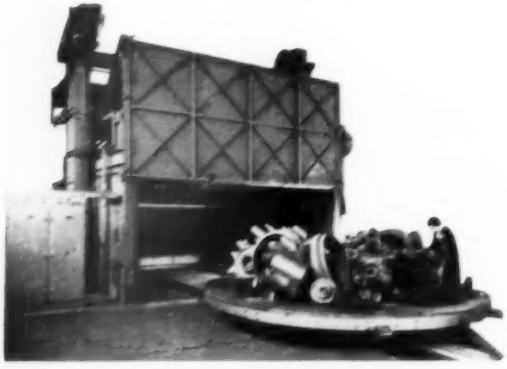
CASTINGS

Centriblast 18 square
Airless Room Plant.

CASTINGS

Centriblast Rotary
Table Machine.

CASTINGS



Centriblast Rotary Barrel Machine.

All types can be treated with speed and economy in

CENTRIBLAST

AIRLESS BLAST
CLEANING PLANT

We make a full range
of Machines for any
application of the
Blast Cleaning Process

SPENCER & HALSTEAD LTD

Bridge Works,
Ossett, Yorkshire.

Tel.: 821-4. Grams: Spenstead

Pawney 5.10

GASBOND

CO_2 PROCESS

Binders

HARMARK
FOUNDRY SUPPLIES

THE MASTER BOND BACKED BY AN
UNRIVALLED TECHNICAL SERVICE

Manufactured by

HARBOROUGH CONSTRUCTION CO·LTD·MARKET HARBOROUGH

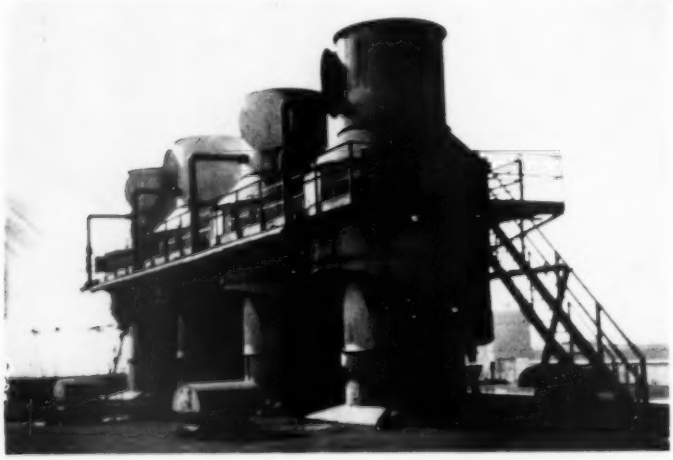
The 'CLEAN AIR ACT' demands EFFICIENT dust and grit suppression

Instal...

TITAN

WET ARRESTERS

Designed by the principal Cupola manufacturers in the U.K. with more than 40 years experience and proven practice in all aspects of Cupola operation.



Many Foundrymen think Wet Spark Arresters are a recent development and because of troubles experienced with some installations, usually caused through bad design, they tend to regard them with suspicion.

We are proud that FORD MOTOR CO. selected **TITAN** Wet Spark Arresters for the **4 TITAN** 30 ton per hour Hot Blast Cupolas which we installed in their new Thames Foundry, the most modern in Europe.

These are illustrated, the second Cupola from the left is " blowing " —note the complete absence of dark smoke, sure proof of efficiency.

Photo completely untouched taken during normal operating conditions.

CONSIDER THESE ADVANTAGES

- **Reduce Maintenance or Replacement of Gutters, Drains and Roof Sheeting.**
- **Protection of Paintwork, Roof Structures and Coatings, Glazing, etc.**
- **Eliminate Fire Hazards. It's worth approaching your Insurance Company!**
- **Improve Working Conditions in Adjacent Workshops Enamelling Plants. Offices.**

THE CONSTRUCTIONAL ENGINEERING CO. LTD

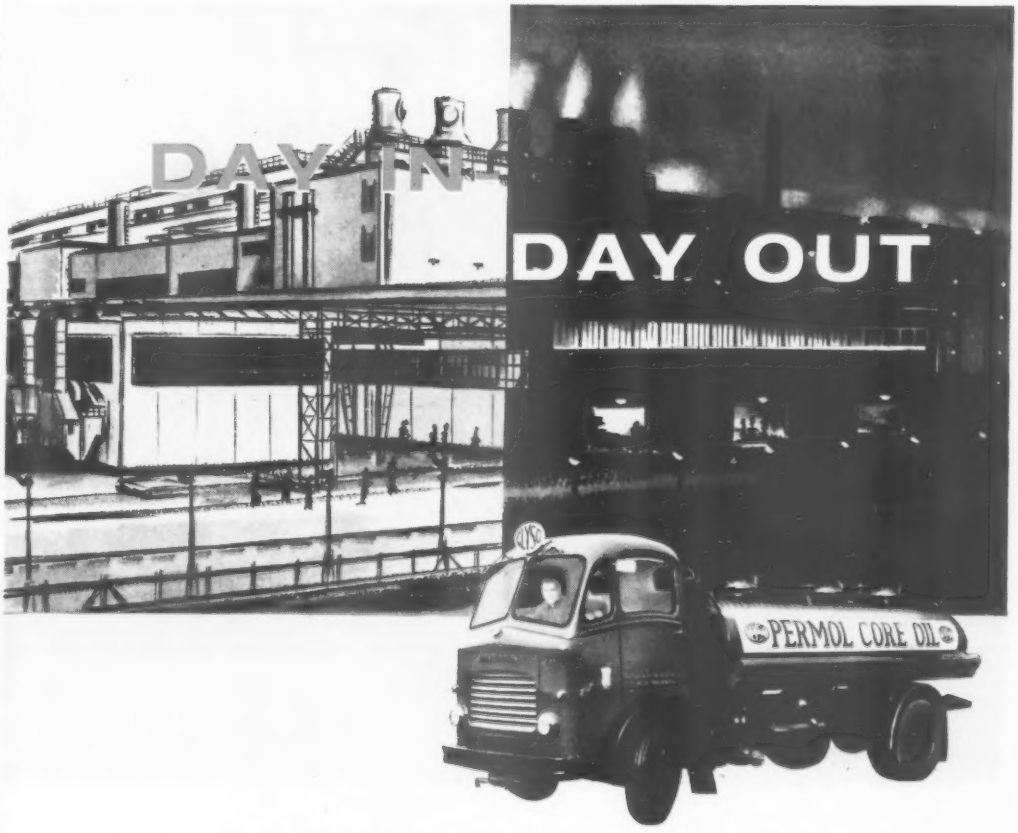
DESIGNERS & ACTUAL BUILDERS OF EFFICIENT FOUNDRY PLANT

TELEGRAMS STRUCTURAL

TITAN WORKS
CHARLES HENRY ST.
BIRMINGHAM 12

TELEPHONES MIDLAND 4753-4

Send for brochure No 213 TO-DAY



By day–and by night, FORDATH **products play** their part in the surging activity of the **foundry.**

By tanker, and by drum FORDATH's Permol Core Oils, Glyso Core Compounds and Exol Cereal Binders flow into foundries throughout the land.

Shell-Mould shops receive their essential PLASTSAND, or where they have installed FORDATH Sand Coating Equipment they wisely base their production of trouble-free shell sand on FORDATH Phenolic Resins.

FORDATH

Full details from:
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Cables: "Metallical" West Bromwich Phone: WESt Bromwich 1665

MANSFIELD
MOULDING SAND

travels long distances to meet the needs of the Foundry—to Scotland and South Wales, to Scandinavia and Singapore, and many other places overseas.

Because *QUALITY* makes its journey worth while

THE MANSFIELD STANDARD SAND CO. LTD.
MANSFIELD · ENGLAND

Telephone: Mansfield 2440

Modern Foundry practice demands

Cupola
LININGS

of high-grade and dependable quality

SPECIAL "LUMEN" QUALITY
39/40% ALUMINA
A PROVED SUCCESS IN MELTING ZONES

BEST STOURBRIDGE FIREBRICK QUALITY FOR *STACK LININGS*

HIGH ALUMINA REFRACTORIES
INSULATING REFRACTORY BRICKS AND SHAPES, AIR SETTING REFRACTORY CEMENTS, ETC.

LARGE STOCKS OF CUPOLA LINING BRICKS AND BLOCKS AVAILABLE FOR QUICK DELIVERY

You can rely on Refractories supplied by:

HARRIS & PEARSON LTD., STOURBRIDGE

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ORGANIZATION OF THE UK FOUNDRY INDUSTRY

The foundry industry of the United Kingdom is represented by the following organizations, many of whose proceedings are regularly reported in this JOURNAL :—

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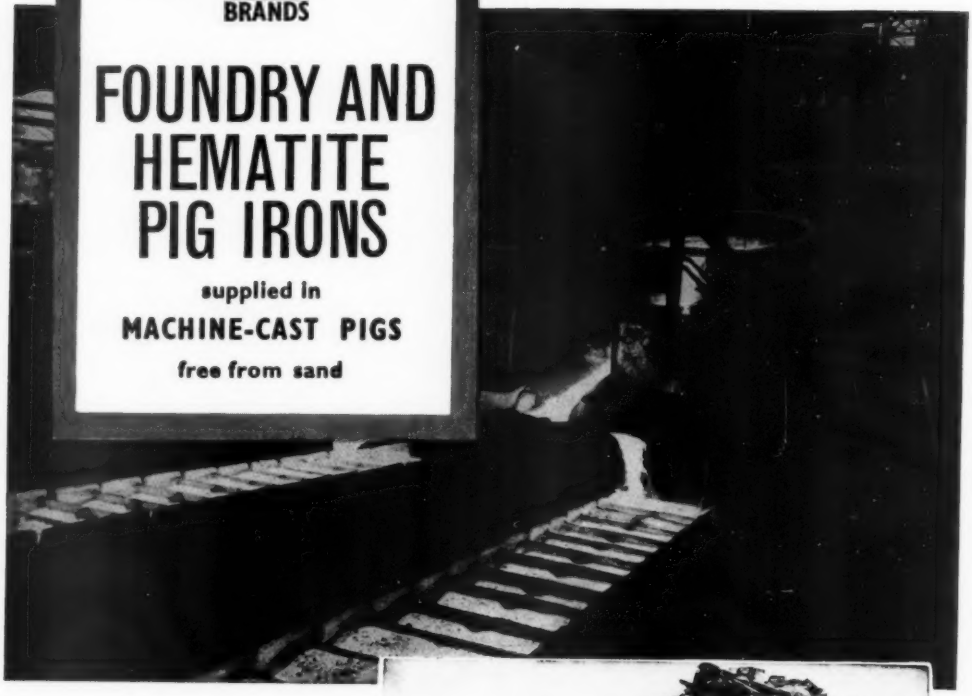

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J.J.M.

FOUNDRY
TRADE JOURNAL

Vol. 108 May 26, 1960 No. 2268

Welding Grey-iron Castings II

The proprietor of a firm of welding engineers has expressed some interesting views on the recent editorial (published in the JOURNAL on May 5) on the reclamation of slightly defective iron castings by welding. He insists that, (*a*), the shop where such work is undertaken should be adequately equipped with mechanical-handling facilities and modern grinding-machines; (*b*), that the weld deposit must be of identical composition with that of the casting to be welded—be it grey iron, high-duty iron, Ni-tensile or spheroidal-graphite iron and (c), the work demands a standard of craftsmanship of a high order.

So much for technical considerations, but the writer's observations on the industrial aspects are also noteworthy. He states that very considerable distrust exists both in engineering and foundry circles as to the scope that exists for the economic repair of new castings. This he ascribes partly to ignorance and partly to a lack of appreciation of the high standard of work emanating from specialized welding shops. Additionally, he states, the welding Press has not been helpful, as it has too often and too persistently stressed the repair of obsolete and broken castings. His final comment is that whilst the existing welding technique for this type of work is quite good, the welding rods at present available could be improved, so that they give an open grain when deposited.

Thus, our correspondent has perhaps unwittingly disclosed the hub of the problem; that is, that before the repair of new castings by welding becomes respectable and acceptable, a specification must be drawn up covering the essential requirements. Initially, there is no need to go to the British Standards Institution, but rather for groups of interested founders to get together, first to prepare a specification, then submit it to their customers and, finally, to reach an agreement for it to be tried out for a limited period. If they feel a little dubious as to their qualifications for such a task, the interested research associations would, no doubt, be only too pleased to help.

Correspondence

FOAMED-PLASTIC PATTERNS

To the Editor of the FOUNDRY TRADE JOURNAL

SIR,—I was very interested in the article entitled "Foamed-plastic Patterns for Making Art Castings?" published in the issue dated April 14, and would look forward to a more detailed description of the actual moulding and casting in the future.

As understood, the material, polystyrene, would be carved by the sculptor. I presume that no attempt has been made to make the casting hollow. At another point, the process is called "foam vaporization," does the artist's model disappear altogether during the casting period? If so, it is to be hoped that the casting will turn out perfect! Are the runners mentioned in this article made of the same substance as the model, or are they just runner holes prepared using the CO_2 process?

I am wondering whether the statement that art casting has nearly disappeared from the American scene is quite correct. It is my understanding that the main American art foundries are normally as full up with commissions as British foundries are. A remedy for this state of affairs would seem to be to persuade more young men to enter this most satisfying branch of the founder's art.—Your's, etc.,

ALBERT L. PARROTT*

79, The Drive,
Morden, Surrey.
May 11, 1960.

*The writer has for many years been in charge of the art foundry of the Morris Singer Company, Limited, in South Lambeth, London—Editor.

European Foundry Apprentice Competition

The European Foundry Apprentice Competition is taking place this week at Wednesbury and Wolverhampton, to decide which young man, not more than 20 years' old, from the Western European countries (including the UK) is the best foundry apprentice, and which nation has the best team of three young foundry workers. (Details of the Competition have been printed in the JOURNAL as the arrangements for it were being made). Judging is by a panel of expert foundrymen from five of the countries represented, under the chairmanship of Dr. J. G. Pearce, C.B.E. Other foundrymen from the various countries are attending as observers. The results are being made known tomorrow (May 27), when the awards will be presented by Mr. P. J. M. Thomas, Parliamentary Secretary to the Ministry of Labour, at a closing ceremony and dinner in the Tallow Chandlers' Hall, London.

Programme

The programme commenced on Sunday, May 22, with the reception of the competitors at Birmingham Exchange Engineering Centre. Then on Monday, the essay, calculations and technology written tests were held at the National Foundry College, Wolverhampton. These were followed on Tuesday and Wednesday by practical tests at the foundry of F. H. Lloyd & Company, Limited, Wednesbury. To-day (May 26), the drawing test at the National Foundry College, Wolverhampton, will be followed by a visit to Stratford-on-Avon. Tomorrow, the British Council has arranged a coach tour of London for the competitors, and in the evening a dinner and the closing ceremony will be held.

Pearson's Centenary Dinner

On May 7th, the Stourbridge refractories firm of E. J. & J. Pearson, Limited, celebrated its centenary with a dinner at the Station Hotel, Dudley. Some 150 members of the staff and their guests attended, and the ceremony was presided over by the chairman of the company, Mr. R. E. G. Evers, M.A.

After the dinner, a message of greeting from Col. C. W. Thomas, C.B.E., who has been a director of the company since its incorporation in 1898, was read by Mr. R. A. Pearson. In proposing the toast of "E. J. & J. Pearson," Mr. W. J. Price, chairman of the holding company, Price-Pearson Refractories, Limited, and of the associate company, J. T. Price & Company, Limited, commented on the remarkable expansion achieved by the company in its century of growth. Replying, the chairman gave an interesting review of the history of the company, based on documentary evidence and on recollections provided by Col. Thomas. Mr. Evers paid tribute to the late Mr. J. W. Thomas, father of Col. Thomas, who he said had served the company well both in its latter years as a partnership and in the first few years since its incorporation as a company. He also referred to the services rendered to the company by his father, the late Mr. Guy Evers, and by Col. Thomas.

Film Review

"Invitation to Prosperity": The premiere of this interesting film was given on Monday, May 16, by the Lancashire Dynamo Electronic Products, Limited, Rugeley, Staffs, to representatives of the Press at the National Film Theatre. The object of the film, which is well achieved, is to show how productivity can be materially increased, and greater accuracy obtained by the use of electronic control. The wide range of applications of electronics is illustrated by such diverse uses as a positional control for a radiotherapy unit, and a £180,000 installation for an impregnating and calendering line of a tyre fabric. After seeing this film, the automatic making of moulds—a now well-known application—appears to be comparatively easy. The film will become generally available in early autumn.

Luncheon

INSTITUTION OF METALLURGISTS

The annual luncheon of the Institution of Metallurgists took place on May 19 at the Park Lane Hotel, London, with the president, Mr. W. E. Bardgett, in the the chair. The guests included Sir Lincoln Evans; Dr. R. Cockburn; Dr. Reginald Bennett; Councillor David Cobbold, deputy Mayor of the City of Westminster; Sir Harry Melville; Sir George Thompson; Dr. J. H. Watson; Air Marshal Sir Owen Jones, and Mr. A. A. R. Harvey, many of whom were accompanied by their ladies.

Latest Foundry Statistics

Steel Castings: According to the Iron and Steel Board and the British Iron and Steel Federation, there was an improvement of 210 workers in the steel foundry industry during March, the total standing at 17,900. The average weekly output of steel castings during March was estimated at only 4,000 tons as against 6,000 (estimated) in February and 4,700 (estimated) in March, 1959.

Acid-resistant Silicon/Iron Castings*

Applications of high-silicon iron castings are increasing, but rightly their production is still confined to speciality foundries. However, it is germane after a lapse of several years, to review in the JOURNAL the early pioneer work, and comment on the present-day status of this small but significant branch of the foundry industry. Extracts from an article of French origin which are printed in the account which follows serve this purpose admirably.

The French metallurgist Jouvé is credited with being the first to have the idea of utilizing the corrosion-resisting properties of the high-silicon iron alloys in the construction of acid-resisting chemical plant. He described their use in the form of apparatus for the concentration of acids in a patent, entitled "New uses of some metallic silicides," taken out in 1903. Manufacture of castings presented a great many difficulties, due to the intrinsic properties of the high-silicon irons, and satisfactory results with "metillures" (the name given by Jouvé to these alloys) were not obtained for some four years.

Later, these irons were manufactured elsewhere, notably in Germany and in the United States of America under trade marks such as Neutral Eisen, Tantiron, Ironac, Elianite, Duriron, Thermisilid and Hypersilid. High-silicon iron castings, sold originally under the trade mark of ferro-silicon Schneider and later as Virgo L.16, have been manufactured by the Société des Forges et Atéliers of Le Creusot since 1932. The properties and applications described in what follows, whilst applying to high-silicon irons in general, are based principally on the behaviour of the Virgo L.16 alloy.

Chemical Composition

The chemical analysis figures in Table 1 show the differences in composition of various proprietary high-silicon irons. The influence of these variations is discussed below.

Silicon

The silicon contents given in Table 1 vary between the limits 14.33 to 17.62 per cent. In order to establish the optimum content for the Virgo L.16 alloy, tests were carried out on a series of nine alloys having silicon contents within the range 12.7 to 17.0 per cent. The rate of corrosion was assessed in a 10 deg. Bé. solution of sulphuric acid at a temperature of 90 deg. C., and in solutions of cold hydrochloric acid at concentrations of 22, 12 and 4 deg. Bé. respectively. These tests showed that a silicon content of 14 per cent. gave good resistance to warm dilute sulphuric acid; the optimum silicon content from all tests appeared to lie within the range 15.5 to 16 per cent. A silicon content of 16 per cent. is the aim for Virgo L.16 alloy. In exceptional cases a content of 14.5 per cent. is used for castings that are difficult to mould, as this gives a slightly less brittle alloy than 16 per cent. occasionally, silicon contents of 17 per cent. are used for simple castings which are required to resist severe corrosion.

Carbon

The carbon content of the alloys shown in Table 1 varies only slightly, the lowest being 0.38 and the highest 0.8. Unduly high carbon contents are undesirable, as graphite is thrown out of solution as the molten alloy cools, and pockets of this constituent can cause rejection of castings. The upper limit of carbon for a 16-per cent. silicon alloy is 0.6. Since the alloys with lower carbon content are harder, more brittle and have a greater shrinkage, carbon contents are usually about 0.5, *i.e.*, close to the upper limit.

Manganese

It is generally understood that increasing the manganese content of high-silicon irons reduces their resistance to corrosion and increases their brittleness. A manganese content of about 0.6 is usual, although no appreciable difference in properties was noted in special alloys which contained from 2 to 2.5 per cent. manganese.

Phosphorus and Sulphur

Both sulphur and phosphorus are harmful elements, and should be restricted to low limits.

Physical and Mechanical Properties

The principal physical characteristics of 15 to 17 per cent. silicon iron are given in Table 2, with

* Abstracted from an article in issue No. 33 of *Les Aciers Fins et Spéciaux Français.*

TABLE 1.—*Percentage Chemical Composition of Various Types of High-silicon Cast Irons.*

Analysis.	Silimaz.	Wessling Gusswerk.	Thermisilid Krupp.	Thermisilid Amag.	Duriron.	Durichlor.	Virgo L. 16.
C	0.595	0.380	0.680	0.550	0.63	0.80	0.50
Si	15.56	17.620	15.270	15.600	14.33	14.85	14.5 to 17
P	0.075	0.052	0.050	0.048	—	—	0.060
S	—	0.008	0.009	0.010	—	—	0.010
Mn	2.65	0.820	0.460	0.460	0.30	0.85	0.50
Fe	81.3	81.000	83.200	83.200	—	—	82 to 84
Mo	—	—	—	—	—	3.55	Trace
Ni	—	—	—	—	—	0.15	Trace
Cr	—	—	—	—	0.05	0.08	0.05

the properties of a typical grey iron. The transverse-strength values quoted in this Table were measured on as-cast bars 12.5 mm. (0.5 in.) square, tested between centres 250 mm. (10 in.) apart. It will be seen that the transverse strength of high-silicon iron is only about the same as that of ordinary cast iron. The Brinell hardness quoted is high, and this means that castings cannot be

TABLE 2.—*Comparison of the Physical Properties of High-silicon Iron and a Typical Grey Iron.*

	High-silicon iron (15 to 17 per cent.)	Grey iron.
Density	6.8 to 7.0	7.3
Melting point (deg. C.)	1,220 to 1,250	1,200
Specific heat (from 0 to 100 deg. C.)	0.130	0.115
Thermal conductivity (cal. per cm. per sec.)	0.078	0.110
Specific resistivity (microhms per cub. cm.)	50	45
Transverse strength (as-cast bar 10 by 0.5-in. sq.)	25 kg./mm² (15.87 tons per sq.in.)	50 kg./mm², (31.75 tons per sq.in.)
Brinell Hardness	350 to 400	180

machined by normal methods, but must be finished by grinding. The alloy is capable of taking a good polish, and, because of its high hardness, resists wear and abrasion. Castings containing 16 per cent. silicon are relatively brittle and sensitive to thermal shock, but providing they are handled with care, and suitable precautions taken when heating up and cooling down, they can withstand high temperatures, and breakages need not occur.

Casting Design

Besides being relatively brittle, the 16-per cent. silicon iron alloy has a high shrinkage, comparable to that of steel (18 mm. per metre, or approximately $\frac{3}{16}$ in. per ft.). These and other factors add to the difficulties of the foundryman, and should be taken into account at the design stage. It is difficult to give general rules, but several main principles can be stated as follows: (1) Projections which might impede shrinkage, such as flanges, ribs, etc., should be avoided wherever possible; (2) the design should facilitate isothermal cooling; (3) large flat sections should be avoided, and (4) as silicon/iron alloys can only be finished by grinding, provision must be made for soft steel inserts where threads and similar fixings are required.

Melting Practice

High-silicon irons cannot be produced by normal furnace melting practice from raw materials such as pig-iron, steel scrap, ferro-silicon, etc. The feeder-heads of castings poured from metal melted without proper precautions will first of all develop pipes in the normal way, then molten metal will be forced back "up the pipes" by hydrogen expelled from the molten metal during cooling. Appearance of molten metal in this way or, in extreme cases, a fountain of molten metal, is undoubtedly spectacular—unfortunately, the casting obtained is always riddled with blowholes, and unfit for use. To avoid this defect, melting practice must be divided into two stages: (1) The preparation of a master alloy, and (2) melting together a mixture of master alloy and manufacturing scrap.

The master alloy can be prepared in one of two ways. The first consists of pouring medium-carbon steel from an electric furnace into a ladle containing 99-per cent. pure silicon, previously heated to a dull red heat. Alternatively, an alloy of the correct chemical composition can be melted in a rotary or electric furnace from a charge of 25 per cent. ferro-silicon, selected steel scrap and pig-iron. In both cases the master alloy is run into metal moulds to solidify.

The following three types of furnace have proved to be satisfactory for melting silicon/iron alloys: (*a*) Rotary furnace fired with powdered coal; (*b*) electric indirect-arc furnace, and (*c*) crucible furnace. Before pouring, the final melt is checked for gas content by means of a test-piece made in a sand mould. Observation of this test-piece during solidification gives a good guide to the gas content of the molten alloy. A low gas-content will be indicated by a large shrinkage cavity, and a high gas-content by the ejection during solidification of a globule of molten metal. Occasionally, an alloy with a higher hydrogen content than normal has been used in castings inclined to develop piping. In this way the development of piping is avoided, and a sound casting can be produced. This practice however must be reserved for exceptional cases.

Mould Making

Green sand, dry sand, core sand and good quality loam, customarily used in foundries, can be employed for making moulds for silicon/iron alloys. Accurate patterns are essential and moulds must be well made, as the formation of "flash" encourages cracking in the casting. Parts of the mould likely to restrain free shrinkage must be made as weak as possible. Straw is often used behind flanges, around bosses and unions, and in parts of the mould which are likely to be compressed during shrinkage. Cores must not be too hard, or they can cause shrinkage cracks, and if they are too soft they allow swelling of the interior surface. In the case of silicon/iron alloys this swelling is often accompanied by a split in the centre of the casting.

Runners and Feeders

The formation of hot spots due to large pouring channels must be avoided. It is common practice therefore to use a number of small ingates.

Hot Stripping

To allow the castings to contract freely in the mould, it is usually necessary to strip part of the mould as quickly as possible after pouring, so that projections such as flanges do not interfere with the normal contraction. Final stripping can be carried out some three days after pouring.

Finishing and Machining

Castings are usually allowed to stand for a week before they are fettled. All fettling processes are usually carried out by grinding, and care must be taken to avoid local over-heating, which could cause cracking.

TABLE 3.—*Resistance of Virgo L.16 Silicon/Iron to Corrosive Media.*

Loss per square decimetre per hr. { TPA = 0.001 to 0.01 gm. PA = 0.01 to 0.10 gm. A = <0.1 gm.

Reagent.	Condition of attack.		Resistance.
Acetic acid ..	(per cent.) 25	cold	1
	80	boiling	1
Hydrobromic acid	10 concentrated at 48 deg. Bé	cold	1
	10 at 48 deg. Bé	cold	TPA
Hydrochloric acid	5	cold	1
	10	cold	1
	10	100 deg. C.	PA
	20	cold	TPA
	20	boiling	A
	Concentrated	cold	TPA
Chromic acid ..	5	cold	1
	50	boiling	TPA
	50	cold	1
Nitric acid ..	All concentrations	cold	1
	.. ..	boiling	1
Phosphoric acid ..	5	cold	1
Sulphuric acid ..	1	boiling	1
	10	cold	1
	10	90 to 100 deg. C.	TPA
	32	cold	1
	32 saturated with Cl	cold	1
	32	80 to 90 deg. C.	TPA
	75 60 deg. Bé	boiling	TPA
	75 concentrated at 66 deg. Bé	100 deg. C.	TPA
Sulphuric dioxide		400 deg. C.	1
Nitrosulphonic acid	$\frac{H_2SO_4}{37.5}$ $\frac{HNO_3}{37.5}$ $\frac{H_2O}{25}$	115 deg. C.	1
Sulphuric acid and phosphoric acid	H_2SO_4 at 50 deg. Bé (15 per cent.) H_3PO_4 at 45 deg. Bé (65 per cent.) H_3PO_4 at 50 deg. Bé (65 per cent.)	110 deg. C.	TPA
Sulphuric acid and $CuSO_4$	Saturated solution of $CuSO_4$ with 50 gm. H_2SO_4 per litre	100 deg. C.	1
Sulphuric acid and sodium dichromate	Concentrated H_2SO_4 (130 gm. per litre) saturated with $Na_2Cr_2O_7$	90 deg. C.	1
	Concentrated H_2SO_4 (130 gm. per litre); $Na_2Cr_2O_7$, 10 gm. per litre	90 deg. C.	1
	30 per cent. H_2SO_4 (120 gm. per litre); $Na_2Cr_2O_7$, 25 gm. per litre	60 deg. C.	1
Sulphuric acid and oxygenated water	H_2SO_4; 5 per cent. by volume in H_2O (5 per cent.)	cold	1
Sea water: salt spray			1
Soda	Solution 36 deg. Bé, boiling	120 deg. C.	TPA
	Solution 48 deg. Bé	cold	1
	Solution 50 deg. Bé	160 deg. C.	A
Stannous chloride	28 deg. Bé	cold	1
	28 deg. Bé	70 deg. C.	A
Mercuric chloride ..	0.7 per cent. by weight	cold	1
	.. .. ..	70 deg. C.	TPA
Oleum	20 per cent. sulphur trioxide	80 to 100 deg. C.	A
Aqua regia vapours	HCl (72 per cent.), HNO_3 (8 per cent.), H_2O (20 per cent.)	cold	PA
Sulphuric acid vapours	Concentrated acid 66 deg. Bé	150 to 165 deg. C.	1

Resistance to Chemical Corrosion

Silicon/iron alloys have a remarkable resistance to the attack of many mineral and organic acids and corrosive solutions. Resistance to sulphuric acid is excellent at all temperatures and concentrations, whereas under the same conditions austenitic nickel/chromium steels are generally heavily corroded. Table 3 shows the results of corrosion tests carried out in a variety of corrosive media on Virgo L.16 corrosion-resisting silicon/iron alloys. The corrosion resistance of the 16-per cent. silicon/iron alloys is said to be slightly better when castings retain their "as-cast" skin.

Improvement of Properties

In an attempt to improve the machinability and reduce the brittleness of 16-per cent. silicon/iron alloy, without reducing its resistance to corrosion, numerous tests have been carried out. These include: The addition of antimony, an increased phosphorus content, an increased manganese content and the addition of magnesium. In other tests part of the silicon content was replaced by nickel, copper, chromium or molybdenum. Some improvement has been obtained in particular individual properties, but the standard composition has been found to have the best all-round properties.

Durichlor (an alloy produced by the Duriron company), which contains 14.5 per cent. silicon and 3 per cent. molybdenum, is intended to resist all concentrations of hydrochloric acid up to boiling point. Whilst it has been established, by experiment, that the addition of molybdenum increases the resistance of 14.5-per cent. silicon alloys to the attack of hydrochloric acid, similar results have been obtained with a 16-per cent. silicon/iron alloy without molybdenum.

Principal Uses

Silicon/iron castings have been used in many applications, such as reciprocating acid pumps, centrifugal pumps, sulphuric-acid concentration plant, nitric-acid concentration and denitration plant, heat exchangers and various forms of pipework. The limited mechanical properties of the silicon/iron alloys are more of a hindrance to the founder than to the user, since in many and varied applications the excellent corrosion-resisting properties of these alloys ensure a long and trouble-free working life.

BIBLIOGRAPHY*

"Some Casting Problems of Acid-resisting Irons," by John Longden, FOUNDRY TRADE JOURNAL, December 7, 1922.
"Acid-resisting High-silicon Iron," FOUNDRY TRADE JOURNAL, March 25, 1937.
"High-silicon Cast Iron," by F. Marsden, FOUNDRY TRADE JOURNAL, January 23, 1941.
"Acid-resisting Cast Iron," FOUNDRY TRADE JOURNAL, February 13, 1941.

* Not exhaustive.—Editor.

NEW LABORATORIES at Wantage (Berks) of the Isotope Research Division of the Atomic Energy Research Establishment, Harwell, were officially opened on Monday by Lord Hailsham, Minister for Science. They cost more than £750,000.

Ironfounding Health and Safety

Continuing the Report on the Papers and Discussions from the CFA Blackpool Conference

(*Continued from page* 530)

When the CFA-organized Conference broadly considering aspects of foundry health and safety of particular applicability to ironfounders reassembled on the Thursday morning (at the Norbreck Hydro, Blackpool), the first session was devoted to a study of the cost of dust. By this was meant the broad picture of the account which the industry has to meet as a result of insurance claims and manpower loss arising from the incidence of pneumoconiosis and also the cost of dust removal generally. The session was divided into three papers, the first two being an introduction to dust-produced lung disease and a survey of its incidence in iron foundries respectively and the third on dust control. A further session, in the afternoon, covered the needs of small foundries, and personal protective equipment.

Introduction to Pneumoconiosis

By Dr. G. MacBain, D.S.C., L.M.S.S.A., D.I.H.

At the first conference session on Thursday, Mr. R. H. Buckland (Ley's Malleable Castings Company, Limited), a member of the CFA Safety Committee, joined the chairman, Mr. H. A. Bonney, at the presidential dais. Mr. Bonney then introduced the author of the first paper, Dr. MacBain, who is medical officer for Birmid Industries, Limited. Initially, the author gave the background to the industrial lung-diseases now known as pneumoconiosis. So as to be precise, he read from notes at this juncture and quoted the several definitions of the disease as "boiling down" into fibrosis (scarring) of the lung arising from silicious dust or any other dust. The disease, he said, was as old as the industry of mining and quarrying, but initially it had been confused with tuberculosis. When however the tuberculus bacilli were isolated it was realized that there was definitely a separate lung condition to which miners and quarrymen were subject. In the present century, chest X-rays had confirmed this view and a vast number of medical histories had been assembled.

Dr. G. MacBain, D.SC., L.M.S.S.A., D.I.H. *(medical officer, Birmid Industries, Limited), who presented "An Introduction to Pneumoconiosis" in the session dealing with the cost of dust.*

Present-day Conceptions

Diagnosis

Nowadays, pneumoconiosis was diagnosed by elimination from a list of possibilities based on: (1) X-ray films of a person's lungs—here, film quality and interpretation of the radiograph were of great importance; (2) and (3) medical and industrial histories, respectively, of the subject, and (4) the doctor's own industrial experience. In the foundry industry, it was specifically silicosis with which the industry and the medical profession were concerned.

Occurrence

The occurrence of silicosis could be classified with the degrees of severity as follows: (1) Pneumoconiosis without obvious symptoms; (2) with some symptoms; (3) with some attendant disability of the patient, and (4) with complications. In the first degree, the patient didn't know there was anything wrong. In the second, he felt very little, if any, change; in the third, he suffered shortness of breath and some cough, was diffident about starting work in the morning or, for example, about cycling uphill. This degree might lead to retirement before normal age or result in invalidism. The fourth degree was chronic and deterioration with time was almost inevitable.

Future Outlook

Again, Dr. MacBain classified the various degrees of severity of the disease in terms of the patients future outlook or rather in terms of whether or not the man was a "good insurance risk." The first category he described as being a good risk unless the patient was a young man, in which case such early incidence indicated susceptibility to the disease. The second category he classified as being a fair risk, but no change of job was required. Referring to category (3), the author said that the patient's condition would not deteriorate if he was withdrawn from the risk of exposure. In an iron foundry, such a man could be permitted to continue in his job, but he suggested a change in severe cases; such cases were rarely given a certificate of incompetence for work. Turning to category (4), Dr. MacBain said in these there was rarely much hope, as tuberculosis often superseded and was aggravated by pneumoconiosis. The last two groups he had

*Previous reports on the conference were printed in the JOURNAL, April 21 (p. 493) and April 28 (p. 528).

named were the only ones seen by doctors, only by comparative coincidence were the first groups discovered. However, to discover incidence was all-important, he added, and this last point was the problem of medical investigators and research. The first need was for a comparative basis to be established between one observer and another and one country and another, and X-ray pictures were the only common denominator. Such a comparator scale had now been developed internationally.

However, a number of (*a*) beliefs and (*b*) doubts, needed checking. Under (*a*), three questions needed investigating, viz; was one man more susceptible to the disease than another?; when men had been exposed to dust for a long time, would you invariably find most cases?; where there was most dust, would there be most cases of pneumoconiosis? Under (*b*), the author also listed three avenues of investigation:— Was deterioration inevitable; was deterioration evenly spread over years of exposure; did ironfounders in fact get worse in absence of other infection? Dr. MacBain also said that the medical people would like to see the following ideas also added to the list for investigation: Where there is most gross-size dust, was there also more micro-size dust? Where in micro-size dust there was most silica, there would be most-severe pneumoconiosis.

Concluding his paper, the author asked further questions which he felt were most important if the incidence of pneumoconiosis in foundries—and elsewhere—could be reduced and dealt with—Could anyone ever define a safe dust-level and could this be achieved in practice? Were approved masks inevitable and was it possible always to diagnose the disease by means of X-ray?

Incidence of Pneumoconiosis in Iron Foundries

By Dr. G. F. Keating, D.I.H.

In commencing his paper on the above subject, Dr. Keatinge who is physician to the Butterley Group of Companies, first introduced his own position in regard to the pneumoconiosis studies; he explained that at a doctors' conference held in 1955, a long-term policy had been instituted to assess the present state of knowledge in regard to the disease. This had resulted in the collection of a number of different sets of statistics, not all of which could be related one to another, because of different methods of reporting by different people. For example, the results were not comparable because of differences in patients' medical history, in X-ray techniques used and their interpretation, not to mention "observer error"—which latter not only varied from one person to another but with the same observer at different times. Dr. Keatinge went on to report figures from a number of surveys which had been carried out. He commented on these experiments in detail and discussed those with which he himself was familiar. For example, he said, in one survey where 53 employees were X-rayed a second time after an interval of ten years, in only three cases did the radiographs show a change for the worse, and the health of these three men was not affected in any other way. This raised the question of how men inhaling a dust containing up to 25 per cent. free silica could show such little X-ray change.

Of course, the lungs of foundrymen also contained iron-oxide dust, giving rise to the question as to how far original X-ray diagnoses were due to iron dust which looked the same on an X-ray plate. Following a death of a moulder as a result of an accident, the whole of his lungs had been examined, section by section, and it was found that much of the opaque material was iron, analysing to silica 0.33 per cent. and Fe_2O_3 0.37 per cent.

Further light on X-ray changes were revealed by exposing rats for several weeks to heavy dust-

Dr. G. F. Keatinge, D.I.H. *(Physician to the Butterley Group of Companies), who dealt with "The Incidence of Pneumoconiosis of Iron Foundries" (following Dr. MacBain).*

clouds, the lungs of these rats being afterwards compared with those of controlled rats. Examination afterwards had showed little fibrosis of their lungs—though, of course, rats were not always comparable with humans. It was then concluded that radio-opaque iron dust must be playing a part in producing X-ray results as seen in the lungs of some foundry employees, but it *was* only a part. It was therefore dangerous to accept the idea of iron-dust inhalation as a means of allaying fears as to the seriousness of the pneumoconiosis problem.

Back to Foundries

Going back to the foundries, Dr. Keatinge said that after the doctors' conference in 1955, the CFA had decided to carry out further very extensive surveys, all the results being assessed under as near as possible identical conditions. (The results of this survey were then reported in detail, but it is not yet possible to reproduce them in the JOURNAL.) Explaining the latest results at some length, Dr. Keatinge said that other factors taken into account were X-ray film changes consequent on advancing age of a person, effect of urban life, heavy smoking, etc. In so far as results were comparable, the X-ray changes of personnel in large and small foundries seemed to show little difference from each other. For obvious reasons, fettlers were at the most risk, moulders' risk was somewhat less (the particle size of moulding sand is generally large, so this is not a factor and fibrosis was probably due to the previous use of parting-powder containing silicious material.

The results of these surveys posed the rather

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disquieting question for the Conference: "Would you allow your son to work as a fettler?" However, much could be done and was being done and many enlightened founders were making real progress in eliminating dusty working atmospheres.

Preliminary Discussion

At this juncture, the chairman, Mr. Bonney, said the survey containing the figures reported by Dr. Keatinge would shortly be published, and then opened the meeting for discussion of the two papers presented by the medical fraternity.

Opening the discussion, another works doctor who was present in the audience suggested that the tendency to develop silicosis appeared to be more one of inherent susceptible physical make-up than of environment or ancillary disease. To this Dr. MacBain replied that diagnosis by job was a menace and investigation of the "foundry" problem had suffered by overtight analogy with coalmining pneumoconiosis. The three factors used for judgment were X-ray examination, clinical examination and industrial history. At present one could not say for certain whether pneumoconiosis was a problem of the susceptibility of man, or of industrial history. On the question of bronchitis complication, Dr. Keatinge said some persons could be regarded as susceptible but anybody exposed sufficiently long to dangerous-size dust would undoubtedly be affected. Asked (*a*) about the depression complex induced in a man when told that he had incipient silicosis, (*b*) whether haemorrhage was a symptom or (*c*) did milk or beer help, the same speaker replied that (*a*) was a very serious matter, morale being very important and easily undermined. Discretion was essential when deciding whether a man should be informed he had the disease in an early stage. His answer to the question (*b*) was in the negative and to (*c*) that he was all in favour of beer (!) but there really was no justification in saying this or milk was efficacious. Dr. MacBain elaborated this reply and referred to the very real danger of inducing an industry of neurotics. He himself was very careful when reporting results of X-ray examination and to say: "working life expectation not affected" or "probably no worse than any normal person" rather than to assess "percentage disability." The latter was a bad way of expressing a condition because it got tied up with monetary compensation matters. Asked what percentages of cases examined could be assessed as serious in regard to future exposure, Dr. Keatinge reported that of 1,400 foundrymen who had recently been X-rayed, in only 68 cases had the chest X-ray appearances been considered sufficient to warrant a recommendation that the man should receive a clinical examination. However, age was an important factor. If, for example, a man of 25 were to show a category-2 X-ray film, he should be regarded as susceptible and not continue in the same type of work; but the same X-ray appearances in a man of 45 would not call for action as the man might well continue in his occupation for the rest of his life without deterioration.

"How to Control Dust"

By W. B. Parkes

In the introduction to this paper, the author began by saying that every breath taken, took in a certain amount of dust and the question which naturally followed was: "How much was dangerous?" Some foundries' records for dust counts were now so good that they could be used as "targets" for others to aim at. In the field of mining, permissible dust-levels were quoted for different sorts of operations, *e.g.*, soft mining and anthracite. The French and Americans had carried out some work on this subject, and the French in particular had produced a formula to give a numerical expression to the dust hazard at any

Informal shots of the audience at one of the technical sessions during the CFA Blackpool Conference.

particular location. This Mr. Parkes quoted as:

$$t = 3.32 \log CT - K$$

where, t, was the risk, C the number of particles between ½ and 1 micron in size per ml, T the temperature and K a constant for the instrument. Under such conditions a value for t of less than five could be regarded as safe, between five and six meant some remedial action should be taken, and greater than six indicated a location unfit for working in. However this method had not proved very helpful for foundries, particularly because to reduce the index from six to five meant that the dust in the atmosphere had to be halved. At least, however, the index did provide something concrete to work upon.

BCIRA Investigations

Discussing the examination of the problem at the British Cast Iron Research Association, he said it was held necessary to measure the dust as this was essential if expenditure on dust-removal systems was to be justified. Mr. Parkes went on to detail two methods of dust estimation—(1) by precipitating the dust on to a slide and (2) by filtration methods. Referring to method (1), the author said that the Owens-Jet method was quick and thermal precipitation was slow but accurate. Passing on to method (2) he said, one could obtain large quantities of dust of all sizes, but mentioned in passing that large-size dust was not dangerous anyway. Thus, application of the Hexlet dust-estimation apparatus was regarded as a "life-saver" in this field. This system first eliminated the coarse dust and it was possible with it to take dust samples over a period of a week's working in a foundry and obtain specimens large enough to carry out analysis by X-ray diffraction. (As an aside, Mr. Parkes said here that co-operation between founders and the Factory Inspectorate was a valuable two-way exchange and it was best for founders to put their "cards on the table" in their dealings with factory inspectors.) Silica, he continued, existed either (*a*) as free SiO_2, (*b*) as tridimite, or (*c*) as crystobalite. Tridimite was regarded by some as being the most dangerous from the silicosis point of view, but it should be borne in mind that type (*c*) could be produced quickly during the casting of CO_2 moulds.

Dust hazard in foundries could be eliminated in four ways, viz: (1) Don't make any (this was the cheapest way!); (2) by extraction of the dust at the source; (3) by good general and local ventilation, and (4)—if the first three methods failed—by safeguarding the operator.

Methods (2) and (4) had ben covered extensively in literature. In general, Mr. Parkes said that founders made too much dust in quite silly ways and gave as an example the sweeping of floors. To illustrate this point, he exhibited a 3-minute-long film. The "shots" were shown of a "clean" concrete floor being brushed, of the same floor being swept when wet sand had been sprinkled over the surface, and of the total elimination of dust when thoroughly wetted sand was used over the surface. One man sweeping a floor for two min. in a 10-ft.-cube room could, Mr. Parkes continued, create more dust in three hours than a whole foundry did in a week. In France, to eliminate dust, floors were watered with a watering can before sweeping commenced. The moral was that attention must be paid to simple dust-raising operations, *e.g.*, the spilling of core-grindings on the floor of the foundry or coreshop, where they were kicked up afterwards all day long. Other "good" means of creating dust were the use of iron-wheeled bogies on sand-covered concrete floors, the mixing of sand ingredients dry before adding water, and the knocking-out of dry-sand cores when instead wet decoring bars or water-jet cleaning could be applied. To prevent unnecessary dust-raising, Mr. Parkes advocated that founders should give this subject as much attention as safety and accident prevention.

Supplementary Discussion

At the conclusion of this contribution, Dr. MacBain and Dr. Keatinge joined the lecturer for further discussion on the whole aspect covered by the morning's papers.

When asked whether the lecturers still considered it was really an engineering problem to remove dust and if so, what sizes and how much ought to be removed to give a safe level, Dr. Keatinge countered by asking if founders could set a standard such as in coalmining. In addition to the French system reported by Mr. Parkes, the United States also had a "yardstick" which was becoming more generally applied, he remarked. Dr. MacBain said that doctors and engineers were working with the same objective in this matter, but in a somewhat artificial environment. Nowadays it seemed easier to get people to spend money than to think. For example, £50,000 had been spent on developing swing-frame grinder ventilation. The research was fully documented and successful, but he wished he could spend the same amount in persuading personnel that—as far as the general foundry atmosphere was concerned—the dust concentration might only have been improved (where the grinder was used) by 10 per cent. He deprecated the fact that the Factory Act rather encouraged founders to spend money in the way cited.

It was necessary, however, to have a realistic target in relation to clinical diagnosis. Severe, disabling pneumoconiosis was now very very uncommon. The less-disabling type was more common and the results secured from surveys of working environments by application of the Hexlet apparatus should offer a line of attack against this. A paper was being prepared based on 6,000 operative studies of the use of this equipment in dusty atmospheres.

In the long term, he would be prepared to wager that the parting-powder, grinder and shotblasting regulations of the Factory Act, etc., would virtually eliminate serious pneumoconiosis cases over the coming years, bearing in mind that it was only long-term amelioration which could be expected. A "safe" dust-level might be arrived at

if even more work in this sphere could be instituted.

A query as to the value of various ventilation methods—mechanical *versus* natural—was answered by Mr. Parkes, who stressed the difficulty that even ventilating engineers had in confirming or discounting the efficiency of any given system. On the value of mass radiography, Dr. Keatinge said this system was unlikely to pick up (on miniature film) incipient pneumoconiosis, and was thus of doubtful value for detecting very early stages of the disease.

Olivine instead of Sand

As to the use of olivine in foundries as a substitute for sand, it was stated that this material certainly seemed to be innocuous and zircon sand also fell in this category, but it would appear impractical to import these materials in great bulk into UK foundries. Mr. Parkes confirmed this view and said the trouble with olivine (apart from cost) was that it was angular in grain shape, and thus of limited suitability for foundries; but cost was the real trouble with this material and zircon also—the high density of the latter being an added disadvantage. Replying to another question, Dr. MacBain said that it was the silica (SiO_2) which appeared to be dangerous, but no one knew with certainty just what, if any, types of silicious material were safe or in what degree they were dangerous. It appeared men could die from inhalation of pure carbon dust, for example. Correlation was not yet possible between X-ray plates and Hexlet dust-determinations; neither one nor the other could be dispensed with and more information was wanted meanwhile.

There was more risk in knocking-out castings hot, said Mr. Parkes, largely because upward-moving air-currents arising from hot castings were difficult to control and carried dust further into the shop atmosphere. Asked about aluminium as a possible antidote to the disease, Dr. Keatinge debunked earlier reports and said that the latest information showed that aluminium served neither as a preventive nor a cure.

Vacuum Cleaners

Discussing the use of vacuum cleaners, Mr. Parkes said that generally speaking he was scared of them in foundries; some models took out the coarse dust from the air, but he was very doubtful about the degree of fine-dust extraction. To be safe, they really needed to be as efficient as the present-day personal respirator. However, if a cleaner reduced enough of the fine dust in a given shop-atmosphere to significantly reduce the overall percentage present, then it was at least helpful. Dr. MacBain supplemented this remark by saying that he had made a check on an industrial cleaner installed at a foundry and at the time it had extracted all dust down to 10 microns size—*i.e.*, it left the finer material unchanged. The works engineers had taken this problem to the cleaner manufacturers and they had recommended the type which was installed in hospitals and which extracted all dust down to 1 micron. This unit had now been added at the exhaust end of an ordinary type of industrial cleaner and this seemed to represent a real step forward. With the standard model taking out the coarser dust, the supplementary unit was not so quickly clogged.

When the session recommenced on Thursday afternoon, two papers were presented on the general subject of safety in the foundry, and Mr. Bonney, from the chair, introduced the speakers.

Personal Protective Equipment in the Foundry

By E. E. Ward

In his opening remarks on this subject, Mr. Ward, who is safety officer, C. A. Parsons & Company, Limited, explained that he was not himself a foundryman; he was not "blowing his own trumpet," or saying that his firm had "all the answers." He intended merely to report what had been done and some of the results secured.

Safety equipment should be regarded only as a second line of defence—in this category he referred to eye-shields, dust-extraction equipment, aprons, gloves, footwear and barrier-creams. The prime necessity was the removal of hazards, but in his opinion, of the various expedients founders had to adopt, eye protection and dust-elimination were the most important. In relation to the latter, he mentioned that Parsons had installed a fine "wet"-water spray over their foundry knock-out; this helped to keep down the dust and the men seemed to like it. The wearing of respirators was a "must," and as their regular cleaning was essential, this was looked after by the works' medical section. Eye protection, Mr. Ward continued, needed "tailoring" to the job, and workmen were enlisted in carrying out tests at Parsons' works and they had chosen a committee amongst themselves for this purpose which had been fully approved by the management. As an example of thoroughness in promoting a safety policy, every man in the foundry and all visitors were asked to wear safety protective devices. This insistence was a very good propaganda "line," both in and out of the works, and did in fact safeguard casual visitors for whose safety (in law), the company were liable. The goggles became the personal property of the individual and any necessary repairs were carried out in the works by one man who was an expert. The men themselves approved of the design of eye protection chosen and in fact there had been no eye injury in the works during the whole of 1959.

Respirators and Other Protective Devices

On respirators, the lecturer said they used the Mark IV model but probably others were equally as good. There were various opinions as to the

These two groups of delegates at the CFA Conference seem well "wrapped up" in the subject as the lecturers proceed.

wearing of gloves, but he had found those of reinforced leather with woollen wrists to keep out metal were best. Personally, he would be horrified if any grinder or user of any other rotating machinery wore gloves, because they could be caught up in moving parts and thus be dangerous. His firm used barrier-cream quite extensively; the men liked it and no skin trouble had been reported. Leather aprons were supplied, size 2-ft. 6-in. sq., with eyelets in three corners, so that as they wore, they could be turned. Protective spats were not yet a legal requirement of the Foundry Regulations, but most foundrymen did, in fact, wear them. As to safety footwear, many of his men preferred this type, but equally quite a number did not. It was significant that of three foot accidents last year at Parsons' works, none of the victims was wearing safety boots. The better-looking types of footwear were, however, becoming popular.

In general comments, the author added that showerbaths and washing facilities at the firm were now in full demand, good housekeeping was a major factor in accident reduction and tidiness and cleanliness were now well inculcated. Protective clothing by itself was not enough, there must be a psychological approach to persuade men to adopt it. Here, it was useful to get a man from the floor on to the safety committee and then the others would respond, but such moves *must* have management backing. Safety consciousness could be instilled after a hard, but worthwhile, battle. It was imperative to teach men the right way to tackle a job and get the foremen, managers and leading hands to set an example. Mr. Ward concluded by offering the benefit of his firm's experience in handling radio-isotopes to anyone who requested it and finally reported that last year's accidents at the firm had totalled eight—equivalent to a frequency rate of 1.4.

Accident Prevention in Small Foundries

By M. M. Hallett, M.Sc., F.I.M.

Just as Mr. Ward claimed not to be a foundryman, Mr. M. M. Hallett (managing director, Chamberlain & Hill, Limited) claimed not to be a safety officer, when introducing his subject. First, discussing "how small a foundry"? Mr. Hallett said that a firm's obligations—legal and moral—were the same no matter what the size of the works. The only difference was in the organization of safety matters. He, too, described safety as an attitude of mind and said that inspiration must be supplied—normally from "top" management—and supported by everyone; the foundry manager was the key man in this matter.

Answering his own question, "what can a small foundry do?" the lecturer said a first measure was to study the works' accident book and see where action was most likely to be effective. He then exhibited accident records from the two foundries with which he was associated—not claiming them especially good—and outlined the types of foundry to which they referred. These were: (A) a repetition foundry in which moulding, coreing, pouring, knock-out and sprue removal were all the work of individual men and (B) a foundry of about the same size and undertaking similar work but two-thirds mechanized. These records are shown in Table 1.

Commenting on them Mr. Hallett remarked that it was surprising to find 13 per cent. in the first column due to falling objects despite the fact that no crane was in use and notwithstanding the light nature of the work; there were 16 per cent. due to strains. Cuts on the hand were mainly arising from flash when riddling sand, burns of the foot were a feature of snap-flask working, where breakouts of metal were more likely than with full boxes. Burns in the eye were mainly from metal

sparking up from a surface. He had found difficulty in persuading operators to wear spats but just at the same time as Mr. Bonney's committee had produced a good design of spat, there had been a bad foot-burn in the foundry. This had persuaded everybody as to the value of the protection and now after eighteen months there was virtually 100 per cent. usage. Turning to the consideration of the second foundry, Mr. Hallett reported difficulty in getting the moulders there to wear goggles. An investigation had proved that particles-in-the-eye accidents were related to grinding operations. But here, the grinders were all quite happy to wear goggles—it seemed that it was when they were walking away from their jobs that their eyes received the foreign bodies complained of! The chippers, neither men nor women, would wear even the light spectacle-type goggles, but there had been some success in works (A) in respirator usage while knocking-out.

TABLE 1.—*Percentage Accident Record in Two Types of Foundry, over an Eighteen Months Period.*

Type of accident.	Foundry "A."		Foundry "B."
	58/59.	59/60.	59/60.
Cut	17	10	10
Leg injury or falling object	13	10	3
Burn, foot	14	0	3
Burn, eye	6	0	3
Particles in eye ..	6	5	17
Strains	16	25	7
Miscellaneous ..	28	50	57
Equivalent to ..	42 accidents per 100 employees	40 accidents per 110 employees	60 accidents per 120 employees

Partial Success Only

Again posing a question: "What to do about partial success?" Mr. Hallett had found it relatively easy to whip-up temporary enthusiasm for safety precautions but apathy quickly followed and here he admitted his own responsibility as representing the management. Some operators were just incredibly foolish and little could be done to prevent this type looking for trouble. Managers should not be discouraged by the smallness of their success in accident prevention and safety matters. They would have to be content with small but progressive improvement.

As to fatal accidents, Mr. Hallett had come across one or two in his own experience and had heard of others. There was the type due to electrocution where, in one case, the cupola fettler's inspection-lamp had broken and he seemed to have held the "live" filaments while removing the bulb. The moral lesson here was to use a low-voltage circuit for this and similar applications.

Foundrymen using molten metal every day were apt to forget that it could be a "killer." In one case, a one-ton transfer ladle had collapsed with fatal consequences and breakouts of metal from a mould could also kill a man; internal mould pressure could cause almost horizontal spurting of metal for quite a distance. Breakouts of cupola bottoms could occur, as for example when a man was trapped by corner walls around the cupola "drop" and was killed. There was also the well-known danger of the dividing chute fitted to dual-purpose cupola-chargers. Here, safety doors must be fitted and locked.

Discussion

Mr. R. H. Buckland, also a member of the CFA Safety Committee, accompanied Mr. Bonney at the chairman's table at this session and he it was who initiated the joint discussion of the two previous papers and congratulated the lecturers on the practical nature of their contributions. He thought spats should perhaps be called gaiters and this would dispose of the taunt of "foppishness" which might be made against wearers. As to protective footwear, he said that despite the issue of thousands of pairs at the works with which he was associated (Ley's Malleable Castings Company, Limited), they still had foot accidents—often because the safety boots had been left at home!

(Mr. Hallett interjected here to say that the men in his foundries preferred the word "spats.").

Mr. Ward, one of the lecturers, said that it was the practice with their workmen that if they had accidents while wearing protective clothing, compensation was paid right away. Another questioner asked Mr. Ward if he objected to the use of rubber or PVC gloves for operators working on grinding machines and Mr. Ward said that he did. Another questioner was anxious to learn how the speaker had managed to get all his workpeople to wear eye-protection equipment, to which Mr. Ward replied that they had managed it he was pleased to say and that even pourers had been persuaded to do so also.

The next question was "Must initiative *always* come from the management?" To this came the reply that this was not so and that safety procedures could result from a joint effort between management and employees. Another member of the audience, referring to the use of barrier creams "because the men liked them" (as one of the authors had stated) said were these a good thing or a bad one? To this, the lecturer said that some men were allergic to skin diseases and in that case, those men should be taken off jobs where there was even the slightest risk. A most interesting point was next raised and this was "Were some men prone to accident and was this shown by statistics?" The answer was in the affirmative and this brought a further question on the subject from another member of the audience who asked were these repetitive accidents merely trivialities, *i.e.*, reflections of some workmens' or officials' psychological attitude to their jobs? The concensus of opinion was that besides the individual who liked a daily or weekly trip to the ambulance room, it was a fact that certain individuals were accident prone. This concluded the discussion at this session.

ABBF Propaganda . . . .

. . . . Survey of Ways and Means, by W. R. Buxton

In support of the propaganda efforts now being made by the Association of Bronze & Brass Founders for the development of copper-base alloys and increased usage of castings produced by members, Mr. W. R. Buxton, vice-president of the Association, has issued a statement on the following lines to the *Birmingham Post* for printing in relation to the European Apprentice Competition which is currently being staged in this country.

The casting of bronze and brass is as old as civilization and, in the early days, the brassfounder had but his own experience and the knowledge of his forebears to guide him. There were no such persons as metallurgists, foundry technicians, or research associations to investigate the properties and "castability" of alloys or to evolve new equipment and methods of production. With the coming of the machine age, the uses of bronze and brass castings have become more and more extended, in line with increased knowledge of metallurgy assisted by modern foundry techniques, leading to greater and faster production. The Association of Bronze & Brass Founders has been active in fostering the use of modern methods, not only amongst their own members but also throughout the industry of which they are the officially recognized representatives. In 1952, the ABBF organized a Productivity Conference at which British as well as American methods of increasing the efficiency and productivity of the industry were discussed to the mutual advantage of all foundrymen. Amongst the many methods described, discussed and acted upon by many progressive founders, the following are the lines along which the industry is developing—and indeed must develop—if it is to combat the competition of other materials (including fabrications, plastics, ball and roller bearings, etc.): (*a*) Design of efficient foundry layouts which incorporate the use of mechanical-handling devices; (*b*) the use of insulated (exothermic) feeders to reduce the weight of metal cast and so cut metal losses; (*c*) use of matchplate patterns for machine moulding, and (*d*) nitrogen degassing and the use of metal/mould reaction to reduce unsoundness due to porosity in gunmetal castings.

ABBF Service

In 1953, the ABBF set up an advisory service for the whole bronze and brass foundry industry in the UK and, through area meetings, much useful information was gained concerning such things as foundry design, metal-melting furnaces, shell moulding, the CO_2 process, foundry sands, costing of castings (particularly for the small foundry) and time- and motion-study in the fettling shop, etc. Arrangements have also been made with the British Non-Ferrous Metals Research Association for all members of a technical advisory and research group of the ABBF to have direct access to the comprehensive and metallurgical service provided by both Associations.

The ABBF is giving active consideration to promoting the use of copper-base castings and the best means of countering competition from other materials. The following personal recommendations are put forward for brassfounders: (1) They must develop better castings by new methods of production as, for example, by adoption of centrifugal, continuous-casting, precision, shell-moulding and CO_2 processes, and must be on the look out for any further processes which may become available. (2) They must use better alloys, giving higher physical-properties and thus enabling the weight of castings to be reduced: adoption of the closer limits which have been advocated in the revised BS 1400 would help in this respect. (3) Assistance must be given to the industry's young apprentices to enable them to become first-class craftsmen—by giving them greater facilities for training, both practical and theoretical. (4) More publicity must be given to the industry to show what it is doing.

Perpetuation of Craftsmanship

Since international foundry apprentice competitions were started a few years' ago, the ABBF has been doing all it could with the limited funds available to give young men attached to member-firms a better chance in future competitions. In a competition held last year to choose the boys who would represent this country in the European Foundry Apprentice Competition, six of the seven young men entered from the London area came from member-firms of the ABBF. One point which struck the organisers most forcibly was the fact that no matter how good the boys' practical work, their inability to put down on paper their theoretical knowledge and their ability to cope with ordinary written papers was, for the most part, remarkably poor. (Of the three boys chosen to represent this country at the European Foundry Apprentice Competition, one is from a bronze foundry in Dorset.)

Training of foundry apprentices is receiving the attention *inter alia* of the Council of Ironfoundry Associations and the National Foundry Craft Training Centre. At the same time, the Government has shown its interest by its offer to contribute towards paying for training officers in industry and this interest has extended to the Ministry of Education. A visit has been made to the LCC Shoreditch Training College at Egham, in Surrey, where some 300 trained secondary-school and grammar-school teachers are going through a further three-years' training. The course includes a handicraft course which, in

ABBF Propaganda

turn, comprises a woodworking and metalworking section. In the latter, all students have to go through the college foundry and the principal, Mr. E. F. Marshall, M.A., states that this is the most popular section of the whole course. The most encouraging aspect of this for the foundry industry as a whole is that these teachers will go back to their own schools, set-up foundries and teach their boys the rudiments of foundrywork. The method of instruction is such that the boys' interest is awakened and with this type of basic training, the foundry industry can look forward, in the future, to an influx of young men who know something about foundrywork and are interested in becoming craftsmen.

Plans for Machine-tool Research

What is described as a "caretaker" committee has been set up by the Machine Tool Trades Association to take charge of the co-ordination, with the Department of Scientific and Industrial Research, of plans for the creation of a machine-tool research association. The committee is headed by Mr. J. C. Snow, vice-president of MTTA.

Mr. E. W. Field, president of MTTA, said in his address at the recent annual meeting that the interlinked subjects of education and research must receive far greater attention in the immediate future than they had in the past. In addition to working for the creation of a research association, the MTTA was soon to appoint an education officer, whose duties would include the making of a survey "on both a qualitative and quantitive basis" of the design teams at present working in the industry.

Mr. Field reported that there had been a substantial revival in the industry's order-book and he added that although the main revival had come from development plans in one of the largest users (the car industry), the spread of orders covered nearly the whole field of machine-tool manufacturing. In some sectors the recovery had reached the stage where present manufacturing capacity was insufficient to meet demands. He added that machine-tool users should take advantage of recession periods to re-equip their production lines.

Switchgear Exhibition

Ottermill Switchgear, Limited, staged a three-day exhibition of their products at the Birmingham Engineering Centre, from May 17 to 19. Among items shown was a range of cubicle switchgear, developed to meet the growing demand for switchboards with the modern flush-front appearance and compact arrangement of components. These unit cubicles consist of a mild-steel framework with detachable steel covers, with horizontal and vertical steel members at the front of the cubicle to form apertures into which the fused switches are fitted.

THE "RESTRICTIVE PRACTICES" of buyers at Sheffield works and stores who will see travellers on one day of the week only, is the subject of a complaint by the Sheffield branch of the United Commercial Travellers' Association. They have written to the Chamber of Commerce asking buyers to be a little more accommodating.

Sheffield Smelting Company's Bicentenary

The Sheffield Smelting Company, Limited, which celebrates its bicentenary this year, was founded by John Read, in his own name, as a refiner. At that time craftsmen who could manipulate plated metal found they could do the same with sterling silver, but until the arrival of John Read there was no one able to recover the silver scrap for other uses.

By 1782, John Read had started smelting and had appointed agents in London and Birmingham and leased a 40-acre site near Royds Corn Mill, between Sheffield and Attercliffe. In 1890, when the company became incorporated, there were 112 employees and a 48-hr. week had been introduced; by 1894 a bath house and dining rooms were provided. The business continued to expand and later premises were taken in Arundel Street, Sheffield. At the end of the first world war, further extensions were made to plant and buildings at Sheffield, London and Birmingham.

Under the present chairman, Mr. Robert Jardine, the company has broadened its basis of trade, forming an agency in Italy and an associate company in Cairo as well as acquiring subsidiary companies in London and Birmingham. The light engineering and electrical allied trades fields now come within the company's sphere as well as the production of thermocouple wires for the steel and other industries. This company, which was started by "one young man from a small town" now has a world-wide coverage for its products.

Slight Drop in ECSC Steel Output

Output of crude steel (ingots and castings) in the European Coal and Steel Community in April was, at 5,837,000 metric tons, below the record 6,393,000 tons in March but substantially higher than the 5,310,000 tons produced in April, 1959. The April total brought the community steel output total for the first four months of the year to 24,038,000 tons, an increase of 23.4 per cent. on the 19,487,000 tons produced in the corresponding period last year.

April output of pig-iron and ferro-alloys was 4,363,000 tons, compared with 4,685,000 tons in March, and 3,790,000 tons in April last year.

The demand for steel continues strong and orders received for rolled products in the community last month totalled 4,630,000 tons. This was slightly below the near record total of 4,743,000 tons in March, but more than the 4,433,000 tons booked in April, 1959. Last month's figures included an increase of 150,000 tons in orders from non-member countries. Demand from within the community, for many months the main support of the current boom, declined slightly.

The rise in order-books since early 1959 levelled off in February, the latest month for which figures are available. At the end of the month, they were 13,499,000 tons, against 13,494,000 tons at the end of January and 8,871,000 tons at the end of February last year. For the first time in many months, February deliveries were able to keep pace with the many new orders.

SIR JAMES DOAK, who for some years has been associated with the Indian business of the company, has been elected a director of J. H. Fenner & Company (Holdings), Limited, mechanical power-transmission engineers, Hull.

AFS Officers and Award Winners

At its annual meeting held at Philadelphia Convention Hall on May 11, nine industrial leaders from the industry were elected to national office by the American Foundrymen's Society—the American technical society of the metal castings field. For the period 1960-61, Mr. N. J. Dunbeck (vice-president, International Minerals and Chemical Corporation, Skokie, Illinois) was elected president, and Mr. A. L. Hunt (executive vice-president, Superior Foundry Inc. Cleveland Ohio) was elected vice-president. Elected to serve as AFS national directors for a three-year term of office were Mr. R. R. Ashley (manager of manufacturing, Detroit Controls, Div. American Standard, Stratford, Conn.), Mr. A. E. Falk (managing partner, Centrifugal Company, Long Beach, California), Mr. W. C. Jeffery (product development manager, McWane Cast Iron Pipe Company, Birmingham, Alabama), Mr. J. T. Moore, (vice-president, Wells Manufacturing Company, Chicago), Mr. W. E. Sicha (chief of Cleveland Research Division, Aluminium Company of America), Mr. D. E. Webster (foundry superintendent, American Laundry Machinery Company, Rochester, N.Y.) and Mr. T. T. Lloyd (Albion Malleable Iron Company, Albion, Michigan). Mr. E. C. Jeter (manufacturing manager, engine and foundry division of Ford Motor Company, Dearborn, Michigan) has been elected to serve as a national director of the AFS to complete the unexpired term of a member of the national AFS board. Mr. Jeter is also a member of the Cleveland Engineering Society, the Society of Automotive Engineers and the American Society of Metals.

Society's Awards

Gold Medals

Presentation of AFS gold medals is made annually to deserving leaders of the metal castings industry and this year three men have been selected by the AFS Board of Awards for outstanding industrial achievements. The medals were awarded at the Society's annual banquet, held on May 11 as follow:

Mr. Samuel F. Carter, Jr. (assistant works manager, American Cast Iron Pipe Company, Birmingham, Alabama) was awarded the Wm. H. McFadden Gold Medal "for exceptional contributions to the AFS and the castings industry in the fields of cupola melting, electric steel melting and control." During the past 20 years, Mr. Carter has presented many technical papers before AFS Conventions, regional conferences and chapter meetings, as well as before numerous other organizations and for the Press. He received a degree in industrial chemistry at Birmingham Southern College and earned his M.S. degree in metallurgy at the University of Wisconsin in 1941. Mr. Carter joined his present company in 1941 as chemist and metallurgist and was appointed assistant works manager in 1955.

The second gold medal (the Thomas W. Pangborn Gold Medal) was awarded to Mr. W. W. Levi (metallurgical consultant, Radford, Virginia) "for outstanding contributions to the Society and the ferrous-castings industry in the field of cupola metallurgy, research and operation." Upon receiving a B.S. degree in chemical engineering at the University of Michigan in 1926, Mr. Levi turned his energies to the castings field, concentrating his activities in grey-iron and malleable foundries. For eight years he worked at several Deere & Company foundries. He joined the Lynchburg Foundry Company in 1934 and progressed to the post of chief metallurgist at the Lynchburg and Radford plants. In 1959, Mr. Levi established a consulting metallurgical company of his own. He is a past chairman of the AFS Piedmont Chapter and one of the chief authors of the book "The Cupola and its Operation." He has also served as an instructor at the AFS Training and Research Institute.

Mr. T. D. Stay (technical advisor, Reynolds Metals Company, Cleveland, Ohio) was awarded the Joseph S. Seaman Gold Medal "for outstanding technical contributions to the Society and light-metals industry over many years, particularly in alloying and castings." Upon graduation from the Case School of Applied Science (now the Case Institute of Technology) in 1914, Mr. Stay began work in the casting of light metals, so that he can rightly be classed as one of the pioneers in technical developments in the non-ferrous and sand fields. His years of research have resulted in many innovations in moulding, casting and fabrication as well as ingot casting and forging methods. Singly, and in collaboration with associates, numerous important Patents in the light-metals field bear his name. Mr. Stay has served with the National Transit Pump and Machine Company, Aluminium Castings Company and Aluminium Company of America, and has held his present position since 1944. He has been a member of the AFS since 1920.

Citations

Recognition for outstanding general service of a non-technical nature to the AFS and the castings industry was accorded to two industry leaders when Service Citation Awards were presented. Those honoured were Mr. William M. Ball, Jr. (metallurgist and foundry consultant, R. Lavin & Sons, Inc., Chicago) and Mr. V. E. Zang (vice-president and director of research and development, Unitcast Corporation, Toledo, Ohio). Mr. Ball's citation read "for outstanding and inspirational services to the AFS, its Chapters, and the non-ferrous castings industry over many years." A graduate of the Applied Industries School of the Carnegie Institute of Technology in 1911, Mr. Ball continued his education at night school to study metallurgy, working as a foreman in the brass foundry of Westinghouse Electric Corporation, East Pittsburgh, while doing so. Subsequently, he served as assistant superintendent of the steel foundry, then superintendent of the iron and brass foundry at Morgan Engineering Company, Alliance, Ohio. He held the post of foundry superintendent at Edna Brass Manufacturing Company, Cincinnati, for 27 years, and has held his present position for the past 11 years. The citation for Mr. Zang read "for tireless and continuous efforts on behalf of the AFS and the steel-castings industry in promotion of co-operative technical endeavour." (Mr. Zang was honoured by the Steel Founders' Society of America as a recipient of the T & O Gold Medal in 1957).

Awards of Scientific Merit

Annually, the AFS confers Awards of Scientific Merit to deserving industrial leaders. These Awards are intended exclusively as a technical citation, to recognize outstanding papers, meritorious technical services or effort, and development of a process, method or engineering advancement having future possibilities. Two men were selected for this distinction for 1960. Mr. G. P. Halliwell (director of research, H. Kramer & Company, Chicago) received an award "for noteworthy achievements in the field of brass and bronze casting, and for outstanding technical services to the Society." Mr. Halliwell has been associated with the foundry industry since 1936, when he joined his present company as director of research—a position he still holds today. His work since has contributed greatly to progress in the copper-base alloys and to acceptance of the product by industry. A native of Rhode Island, Mr. Halliwell received his first degree from Worcester Polytechnic Institute in 1915 and after several years as a chemist, entered Yale University to receive his Master's degree

AFS Officers and Award Winners

cum laude in 1920. For the following ten years, he served as research metallurgist for Westinghouse Electric and Manufacturing Company, E. Pittsburgh, and then taught metallurgy at the Carnegie Institute of Technology for five years, before joining his present company.

The second Award of Scientific Merit was presented to Mr. G. A. Timmons (vice-president, Climax Molybdenum of Michigan) "for notable contributions and services to the AFS and the ferrous foundry industry in the fields of heat-treatment and alloying of grey iron." A 1934 graduate in chemical engineering from Wayne University, Detroit, Mr. Timmons earned his M.S. degree in metallurgical engineering at the University of Michigan in 1945. His initial ventures into industrial metallurgy began with American Sheet & Tin Plate Company and in sheet-steel production at Ford Motor Company, Dearborn. He joined the laboratory staff of his present company as a research metallurgist, advancing to assistant director of the laboratory in 1946 and took over his present position in 1952.

British Exhibition in New York

In recent years, the writer has lost much of his early enthusiasm for large international exhibitions because, with a single visit, one cannot, without becoming overtired, see all that one wishes to inspect. However, after listening to Sir Norman Kipping's description of the British Exhibition, which is to be held in New York from June 10 to 26, one was left with an overwhelming desire to visit it. It is to be formally opened by HRH Prince Philip, Duke of Edinburgh, who will have at his side the Vice-President of the USA, the Governor of New York State and the Mayor of New York City.

Included in the Exhibition are a number of co-operative stands, such as those of the Council of Industrial Design and the Engineering Centre. The former will carry over 300 specially-selected exhibits, whilst the latter will show the products of Amal, Limited; Belliss & Morcom, Limited; Delta Metal Company, Limited; Electromagnets, Limited; Finlay Engineering, Limited; Harland Engineering Company, Limited; George H. Hughes, Limited; Mirrlees, Watson Company, Limited; Morgan Crucible Company, Limited; Morleys (Birmingham), Limited; S. E. Opperman, Limited; Platt Metals, Limited; A. G. Thornton, Limited, and Triangle Valve Company, Limited.

The JOURNAL'S North American readers will appreciate the "booths" devoted to Sir Winston Churchill's life, the wedding of HRH the Princess Margaret, a rather composite English "pub," and the British automobile exhibition. The Military Tattoo also will be a spectacle well worth seeing.

Data Sheet: Sterling Metals, Limited, Gipsy Lane, Nuneaton, have distributed to holders of their data book, a new sheet covering the M.S.R., *i.e.* magnesium/silver rare-earth alloys—these are high-strength alloys and, at temperatures up to 250 deg. C., are reported to be stronger than any other magnesium casting alloys.

THE 1960 AUTUMN MEETING of the Institute of Welding, to be held in London, from November 1 to 3, will be devoted to the metallurgy of welding and brazing. The annual dinner of the Institute will be held on the evening of Thursday, November 3.

National Foundry Craft Training Centre Appeal

The trustees of the National Foundry Craft Training Centre, West Bromwich, last Friday launched an appeal for at least £100,000 to meet the cost of their proposals to rebulid the centre and enlarge the hostel. The sum would also provide an endowment to ensure that benefits available remain at the disposal of the industry in the future. About £50,000 of this would, it is estimated, be absorbed by building costs.

A statement by the Joint Iron Council says that by acting now, the foundry industry hopes to offer the kind of training facilities likely to attract boys of good calibre. The Centre, the only one of its kind in any industry, has a capacity of only 12 to 14 boys at one time. The present building is deteriorating and a centre is needed capable of training double the number of boys.

Apprentices from all sections of the industry would be able to profit from improved equipment, and a lecture room, lockers, and showerbaths are among other planned amenities. There is, the statement continues, a steadily increasing demand for foundry technicians because of the progressive mechanization and development of quality control. Many foundries cannot now offer facilities to give the essential basic craft training and it is intended to provide such training at the new Centre.

Since the Centre was set up in 1949, 574 apprentices from 183 firms had received training there by the end of last year.

Institution of Metallurgists

At the sixteenth annual general meeting of the Institution of Metallurgists, held on May 19 at the Park Lane Hotel, London, Mr. W. E. Bardgett, B.SC., research manager, the United Steel Companies, Limited, was elected president of the Institution in succession to Professor A. J. Murphy, M.SC. The following elections were also made:—*President-elect:* Dr. N. P. Allen, M.MET., D.SC., F.R.S. (National Physical Laboratory), in succession to Mr. Bardgett; *vice-presidents:* Mr. E. A. Bolton, M.SC. (Imperial Chemical Industries, Limited, metals division), and Dr. E. G. West, B.SC., PH.D. (Aluminium Development Association); hon. *treasurer:* Mr. L. W. Derry, B.SC., M.SC.(TECH.) (Battersea College of Technology), in succession to Dr. West; *ordinary members of Council:* Dr. I. Jenkins, D.SC. (General Electric Company, Limited, Wembley, Middlesex), Dr. A. H. Sully, M.SC., PH.D. (British Steel Castings Research Association), and Professor C. R. Tottle, M.MET. (Manchester University), and *ordinary member of Council:* Mr. E. Mitchell, A.C.T.(BIRM.) (Lucas Group Research Centre, Birmingham).

Albion Motors to Expand?

Albion Motors, Limited, Scotland's only surviving manufacturers of motor-vehicle chassis, hope soon to develop a 30-acre site near Dumbarton, because there is no available space at their Scotstoun works, at Glasgow, in which to build additional workshops. Dumbarton County Planning Committee have approved the firm's application for the site, which is at present agricultural land, and have consequently applied to the Secretary of State for Scotland for permission to re-zone it for industrial purposes. The site is of 130 acres at Gooseholm Farm on the fringe of the Strathleven industrial estate.

American Letter

How to avoid Sand Segregation*

Research was carried out to discover where sand segregation asserts itself, and how to reduce it. It was determined that sand segregates every time it is moved from one place to another. Four experiments were done, sand being loaded into a silo as indicated in Fig. 1, and then discharged. Coloured motion pictures were taken while the silo was being emptied. The experiments proved that the practice

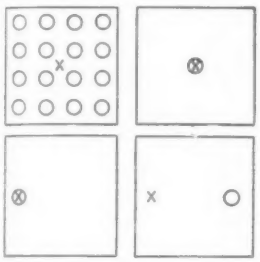


FIG. 1.—*Four experiments were conducted with sand being loaded as indicated. The* X *indicates the point at which the sand was loaded into the top of the silo, and the* 0 *the discharge point on the bottom of the silo.*

of using more than one discharge point (top left in Fig. 1) when withdrawing sand from storage is one of the best developed so far to minimize segregation. The following conclusions were also drawn: (1) Sand tends to segregate every time it is handled; (2) sands of high clay content will segregate less than those which are nearly or entirely clay free; (3) dry sands segregate more than damp sands, and (4) sands of wide grain-size distribution segregate more than those of narrow distribution.

* Summary of work done jointly by the American Foundrymens' Society and the National Industrial Sand Association (published in full in *Modern Castings*).

Methods of minimizing Segregation

The following methods are recommended to minimize segregation:—

Unloading: When unloading sand from railway trucks, work across the truck at right angles to the track, in order to get as complete a cross-section of the sand as possible. This assists in reblending the sand. (Segregation is almost impossible to control in bottom-dump equipment, and reblending is necessary.)

Belts: Distance of fall on to and from the belt should be as short as possible. Wide belts running at slower speeds are better than narrow belts at high speeds. The use of baffles and cones at the point of discharge helps.

Bucket Elevators: The use of baffles at the discharge point is important.

Pneumatic Conveying: Information is limited. No recommendations.

Gravity Flow: Use baffles to reduce the speed of flow and distance of free fall.

Screw Conveyors: Least segregation occurs with this method of conveying.

Storage: Distribute sand uniformly throughout the storage area.

Experimental Aluminium Cylinder-blocks

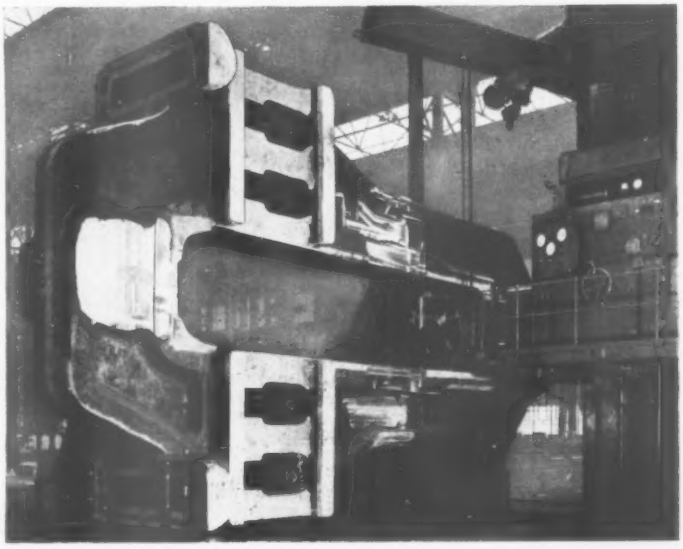
At a recent meeting of the American Society for Testing Materials, M. F. Garwood (chief materials engineer, Chrysler Corporation) reported that his firm now has 10,000 aluminum automobile cylinder-blocks "on the road" in locations where it can keep an eye on engine performance. Made of A-380 alloy (containing approximately 9 Si, 3.5 Cu), the blocks are die cast, a process which Chrysler feels is the best way to achieve maximum economy and quality—no cylinder liners are used. Die-cast aluminum cylinder-heads (possibly two-piece assemblies) are expected to be introduced soon, he added.

150-ton Steel Casting for Davy-United Mill

The accompanying illustration shows a 150-ton housing which was produced as a single-piece casting by English Steel Castings Corporation, Limited, photographed during machining in the Darnall Works of Davy & United Engineering Company, Limited, Sheffield, the machine in question being a 10-in. ram-type post-milling machine. The housing is one of those destined for the 52 by 138-in. slabbing mill which Colvilles, Limited, are building for their Ravenscraig Works. The slabbing mill will supply the heavy slabs required to feed the new hot-strip mill for Ravenscraig which Davy-United are now building.

* * *

It is noteworthy to record this example in heavy-duty engineering of the traditional adoption of a steel casting—in contrast to present-day trends to use weldments for some applications.—Editor.



Bureau of Analysed Samples

Triennial Meeting of Co-operating Analysis

A record number of over 80 analysts representing all branches of the metallurgical industry, government departments and research association laboratories attended a meeting in York on Tuesday, May 10, held by the Bureau of Analysed Samples, Limited.

After an introductory welcome by Dr. E. Gregory, the managing director, Mr. P. D. Ridsdale, gave a report on the progress in the preparation of British Chemical and Spectrographic Standards during the three-year period to November, 1959. His report stated that during this period five new standards have been issued, *viz.*:—(1) refined ferro-manganese No. 280; (2) 13 per cent. manganese-steel No. 290; (3) Lincolnshire iron ore No. 301; (4) Northants iron ore No. 302, and (5) iron-ore sinter No. 303; and that the preparation of the following eight new chemical standards is now in progress: (6) 10 per cent. aluminium-bronze; (7) 6 per cent. zinc/aluminium alloy; (8) 75 per cent. ferro-silicon; (9) magnesium alloy containing zinc and rare-earths; (10) Nimonic "90" alloy; (11) 0.4 per cent. carbon free-cutting steel; (12) chromium ore, and (13) sillimanite refractory. Samples Nos. 12 and 13 are being prepared at the request of the British Ceramic Research Association and No. 11 is being prepared at the request of the Association of Drop Forgers and Stampers.

In addition to work on new samples, replacements of no fewer than 36 standards have been prepared and issued during this period. These include, three carbon steels; three alloy steels; three cast irons; four ferro-alloys; two basic slags; one iron ore; three aluminium alloys; two non-ferrous alloys; seven pure metals, and eight low-alloy steels.

Mr. Ridsdale also announced that work on a further 10 replacement samples is in progress and that since the end of last year three of these have been completed and will be issued shortly, *viz.*:—(14) a 0.3 per cent. carbon steel No. 239/2; (15) a 1.2 per cent. carbon steel No. 163/1, and (16) a bronze containing 3.5 per cent. Pb and 0.5 P. No. 183/1.

Mr. Ridsdale mentioned that standardization of this bronze sample had given a number of laboratories an opportunity to try out several of the draft British Standard methods for the analysis of copper alloys which had been circulated to industry for comment, and that the results obtained had proved that nearly all these methods are very satisfactory.

Spectrographic Standards

Turning to spectrographic standards, Mr. Ridsdale reported that a new series of low-alloy steel spectrographic standards had been issued to replace the original series which was now exhausted. This new series is issued in the form of both the 1-in. sq. section bars and 1¾-in. dia. discs to meet the requirements of the spectrograph and all forms of direct-reading instruments including vacuum direct readers.

Work is also nearing completion on a new series of plain carbon-steel standards for direct-reading instruments. This series which is being standardized for carbon, silicon, sulphur, phosphorus, manganese and arsenic, will be supplied in the form of 1¾-in. dia. discs for spectrographic work, but will also be available in the form of turnings for chemical analysis.

Probably the most important development in the field of spectrographic samples is a new series of cast-iron standards for magnesium and nickel which will be available in the near future. This series, which is being prepared in conjunction with the British Cast Iron Research Association, will cover the range of 0.005 to 0.015 per cent. Mg and 0.35 to 1.4 per cent. Ni and will only be available in the form of 1.2-in. dia. bars for spectrographic analysis.

A steadily increasing demand both at home and abroad for chemical and spectrographic standards was reported and the fact that these standards have been exported to no fewer than 50 different countries during the last three years, gives an indication of the world-wide recognition which they receive.

Mr. Ridsdale concluded his report by thanking all the analysts who had co-operated in the analytical standardization of these samples. The meeting was then thrown open for general discussion during which comments on existing samples and suggestions for new standards were put forward.

A printed report giving details of the proceedings will be issued and will be available on request from Bureau of Analysed Samples, Limited, Newham Hall, Middlesbrough.

Board Changes

HUMPHREYS & GLASGOW, LIMITED—Mr. R. Langford and Mr. I. H. Phillipps, who are associate directors, have been elected to the board. Mr. G. Adams and Mr. R. J. Withers have been elected associate directors.

F. W. BERK & COMPANY, LIMITED—Mr. Claude H. Tanner has been elected chairman in succession to Mr. Arthur D. Berk who is retiring after 18 years as chairman. Mr. Berk will remain on the board until September 5.

METAL PRODUCTS COMPANY (WILLENHALL), LIMITED—Following the death in January of Mr. G. T. Whitehouse, Mr. John W. Whitehouse has been appointed chairman. Mr. John J. T. Whitehouse, Mr. Alfred C. Whitehouse, and Mr. James T. Whitehouse have been appointed directors.

Shaw's Reunion Dinner

The photograph below was taken at the first annual reunion dinner for old employees of W. Shaw & Company, Limited (steelfounders), Middlesbrough, at the firm's welfare club. It shows three of the oldest of those present chatting to the chairman of the company, Mr. G. Shaw (third from left)—they are (left to right) Mr. B. Tudge (88), *Mr. D. Barber* (85) *and Mr. J. Sedgewick* (88).

Notes from the Branches

Lancashire

The annual general meeting of the Lancashire branch of the Institute of British Foundrymen was held on April 30 at the Midland Hotel, Manchester. Officers elected for the 1960/61 session were Mr. F. W. Nield as president, Mr. F. Lord, senior vice-president, Mr. H. Buckley, hon. secretary, and Mr. F. A. Harper, hon. treasurer. Members elected to the branch General Council were Mr. Connah, Mr. Collinge, Mr. Walker and Mr. Tomlinson, and for the branch Council, Mr. Beech, Mr. Spenseley, Mr. Wallwork and Mr. Yeomen. Mr. G. Southern was re-appointed as branch representative to the Technical Council.

The business of the meeting being dealt with, Mr. Lord, who had organized the branch's John Wilkinson Medal competition, after thanking the judges for their services, announced that Mr. D. Thompson, of the Distington Engineering Company, Limited, was the winner of the competition, with Mr. D. Wood, Leyland Motors, Limited, in the second place, and Mr. Hatton, of Harvey & Longstaff, Limited, in third place. He said the judges had also awarded a special prize of £2 2s. for apprentices aged 17 and under, and this would be shared by Mr. Morris of Uttoxeter and Mr. D. Wood of Rochdale. Mr. Lord then asked the branch president to present the awards.

After the presentations, Mr. D. Thompson read his paper, describing in detail the moulding of a 3½-ton filter-drum for the chemical industry, using a slide of the completed casting and a scale drawing of the mould assembly to illustrate his remarks.

Technical Council Reports

Next on the programme was the report on the origin, constitution, terms of reference and progress of the Technical Council of the Institute, which was presented by the Lancashire branch representative on that Council, Mr. G. Southern. At the conclusion of his report, Mr. Southern introduced Mr. G. Hird, the chairman of the Institute's sub-committee, T.S.46, which is concerned with the effect of various moulding sands on castings. Mr. Hird dealt in detail with the research work the committee had carried out on various sands, and their findings. Mr. Wallwork then thanked both Mr. Southern and Mr. Hird for their concise reports and invited members to question Mr. Hird.

Discussion

The first questioner wanted to know if any views of the Americans who were preparing a report on moulding materials had been available to the British sub-committee, but Mr. Hird said no help had been received from that source since T.S.46 had almost completed its task when the Americans started their work. Another member who had received a negative reply to his enquiry as to whether Mr. Hird had ever used reclaimed sand to make test-bar moulds, went on to say that in his own foundry reclaimed sand was successfully used and in fact it was their day-to-day practice to use this sand from the hydroblast to make test-bars. Mr. Southern commented that this success might be due to the fact that the sand grains were carbon coated.

The discussion concluded with Mr. Hird confirming that 0.375-in. dia. was the actual dimension of an ingate which had been shown in one of the slides; for this, he said, a split pattern had been used.

After the chairman had again thanked Mr. Hird for his interesting report, the meeting was declared closed.

Northampton Section

The annual general meeting of the Northampton and district section took place on April 21, at the Plough Hotel, Northampton, and was well attended. The officers elected were: as president, Mr. R. Jelley, senior vice-president, Mr. A. Tipper, junior vice-president, Mr. J. Hope, Members of the Council, Mr. J. Gray, Mr. H. C. Hanson, Mr. J. W. Deaton, Mr. R. Wicksteed, Mr. D. A. Hodgkiss and Mr. L. E. Robinson. Mr. W. D. Ford was re-elected honorary secretary and was thanked for his work in the past year by Mr. L. E. Robinson. A vote of thanks to the retiring president was proposed by Mr. W. J. Wood, and seconded by Mr. G. Hanna, both of whom mentioned the very pleasant manner which the president had always shown in conducting the business of the section.

Work-study in the Foundry

Then followed a talk by Mr. A. A. Timmins, of the British Cast Iron Research Association, on the subject of "Work-study in the Foundry." He explained what was meant by the term "work-study" and how careful examination of a particular job by a skilled observer could produce an analysis of effort which was of real value. Mr. Timmins showed, with the aid of slides, how work-study had been applied in a coreshop, and said results had shown time spent carrying cores took up a large proportion of the working day. This indicated the need for a revised shop layout to reduce transport time, and when this had been done a further study proved that the intended economy of transport time had been effected with beneficial results in production of cores.

A further example concerned the shotblast, fettling and heat-treatment of malleable-iron and grey-iron castings all in one shop. The study showed that transport was again taking up too much of the working day, particularly as counter flow of castings through the shop was often necessary. A revised layout to cut down time wasted in transporting castings between operations was again the remedy, with consequent savings in labour and, more important still, increase in throughput of castings to cope with a foundry expansion scheme.

The point of these work-studies with process charts was shown to be the manner in which they split up the working day into time spent in productive work, time spent in unproductive work; and work which was necessary due to existing conditions. When the latter was expressed as a percentage of the total, inefficiencies were immediately high-lighted.

American Method

Then followed an explanation of Memo-motion, which is another aid to the examination of efficient working methods developed in America by M. E. Mundall. In this method a cine-film is taken, but instead of using the normal 16 frames per second, the speed is variable between the range of one frame per ½ second to one frame per four seconds. When thrown on to a screen by using a specially equipped projector, the movement of the operator can be followed and his various actions can be calculated as a percentage of the whole. This slow-filming technique provides the best possible record of the movements and operations taking place should doubts and discussions on piecework prices arise at some future date.

A number of such films were shown, together with the analysis of operations on a percentage time basis, and these were completely successful in explaining the whole idea. The films were also shown projected on a screen at 16 frames per sec. and this had the effect of speeding up all actions. Apart from being highly

Notes from the Branches

amusing to watch, this was also very useful in pinpointing certain deficiencies, such as idle time on moulding and coring-up operations, because idle time stood out more clearly when normal actions were speeded up.

The paper was very much appreciated and more information was sought than question time allowed, Mr. Timmins was thanked warmly by the new president, Mr. R. Jelley, who said how pleased he was to see the BCIRA interesting themselves in this subject. Mr. R. W. Pipes, a regular visitor from the London branch, seconded the vote of thanks and praised the lecturer both for the excellence of his talk and on equipping himself with three separate projectors for one meeting.

East Anglian Section

In April, 20 members of the East Anglian section visited the works of the Suffolk Iron Foundry, Stowmarket, Suffolk. The parties, coming from Halstead, Braintree, Ipswich and Norwich, had made their own travelling arrangements for the visit, which commenced at 2 p.m. The visitors were welcomed on arrival by Mr. Ashton, foundry manager, who conducted them to the foundry where they were free to find their own particular points of interests. The foundry staff were very helpful in giving information and answering questions.

Foundry

The foundry, a veritable hive of activity, proved to be of absorbing interest. It consists of two mechanized units and a shell-moulding section. The mechanized plants employ moulding machines of the jolt/squeeze-type, adequately served by a comprehensive conveyor system, the castings being for lawn-mowers, mincing machines, wringers and automobile parts. The shell-moulding section's production consists mainly of cylinders for the company's own four-stroke engines.

A visit was then made to the coreshop where the up-to-date core-producing machines are served by overhead sand feed. Both oil- and resin-bonded cores were being produced. In the fettling department many comments were passed on the superb finish of the castings—the rigid inspection denoting the high standard attained. A team of guides conducted the parties to the finished products section of the works, where much interest was shown in the wide range of operations, *viz.*, machining, grinding, cutting, welding, tinning, assembling, testing and packing for despatch.

Speeches

The time passed very quickly, there being so much to see, and the tour concluded with members reassembling in the works canteen for tea and light refreshments. At this point, Mr. J. Siegmund, works manager, took the opportunity of expressing his pleasure at having the section visit his company, and he said he hoped that they had found the visit pleasurable and instructive. He added that he was sorry the works director, Mr. S. Webster, was unable to be present. The section president, Mr. T. D. Oughton, in replying, expressed the gratitude of the section to the management of the Suffolk Iron Foundry for their generosity in arranging the visit, and said he was sure that members had seen and heard much from which they had definitely benefited. He concluded by thanking everyone who had contributed to make the visit so enjoyable. Acclamation followed both addresses.

ISI Translations

From amongst the most recently published lists of translations available from the Iron & Steel Institute (4, Grosvenor Gardens, London, S.W.1), the following have been selected as being of interest to founders. The price quoted is that for single copies, postage extra, there being reductions for quantities ordered. Readers writing for translations, or for further information, should mention this JOURNAL when doing so.

1458 CONTRIBUTIONS TO STEELWORKS CHEMISTRY SAMPLING AND DETERMINATION OF HYDROGEN IN STEEL. Stetter, A. *Stahl u. Eisen*, 1959, July 23, pp. 1087-1090. (£2 10s.)

1563 CRITICAL STUDY OF THE DETERMINATION OF HYDROGEN IN STEEL. Calmettes, J., *et al. Mem. Sci. Rev. Met.*, 1959, Dec., pp. 641-655. (£7 10s.)

1608 PROBLEM OF PINHOLE POROSITY IN STEEL CASTINGS. Wlodawer, R. *Giesserei*, 1960, January 14, pp. 1-7. (£5 5s.)

1662 THE MOST COMMON TYPES OF CORROSION IN STAINLESS STEELS. Berg, S. *Chemische Rundschau*, 1959, April 1, Beilage 2, pp. 185-189. (£4 10s.) Modes of attack are classified as general corrosion, pitting, intercrystalline corrosion, crevice corrosion, galvanic corrosion and stress corrosion. These are further considered and examples are given. An all-glass testing apparatus is shown; much of the data given is derived from the literature. (*JISL* Abstract.)

Translations in course of preparation include:—

1696 INTERNATIONAL DEVELOPMENT OF INSTRUMENTS AND CONTROLS FOR THE IRON AND STEEL INDUSTRY. (In German.) Kruger, H. *Neue Hütte*, 1957, February/March, pp. 103-111.

1703 SPECTROCHEMICAL ANALYSIS OF SOLUTIONS BY SPARK EXCITATION. Larsson, A. *Jernkont. Ann.*, 1959 (8), pp. 508-522.

1704 MEASURING PRINCIPLES OF THE MAGNATEST Q METHOD AND ITS TESTING POSSIBILITIES IN THE STEEL MANUFACTURING INDUSTRY. Michalski, F., and E. Kemenesy. *Materialprüfung*, 1960 (2), pp. 56-64.

The following translations are in course of preparation by Mr. H. Brutcher, Technical Translations, P.O. Box 157, Altadena, Calif., USA.

HB 4681 ON THE CALCULATION OF THE COMPOSITION OF OXIDIZING SLAGS FROM ELECTRIC ARC (AND O.H.) FURNACES. Samarin, A. M., *et al. Izv. Akad. Nauk*, S.S.S.R., OTN, 1947 (12), pp. 1639-1648.

HB 4806 ON THE FAILURE OF CASTINGS UNDER SHRINKAGE STRESSES DURING SOLIDIFICATION AS FUNCTION OF COMPOSITION OF ALLOY. Bochvar, A. A., and Z. A. Sviderskaya. *Ibid.*, 1957 (3), pp. 349-355.

HB 4815 DOUBLE-LAYER SHELL MOULDING FOR IRON CASTINGS. Smirnov, A. A., and I. V. Bobysheva. *Lit. Proizv.*, 1959 (9), pp. 14-15.

The initials ADA, etc., stand for the organization to which enquiries for the translations listed below should be made, quoting the reference numbers. For addresses see end of list.

ADA: Tech. Mem. 404 INFLUENCE OF IMPURITIES ON THE PROPERTIES OF ALUMINIUM. Brenner, P. *Metall*, 1958, **12** (12), pp. 1075-84.

MT 75 MODIFICATION OF HYPEREUTECTIC Al/Si ALLOYS WITH PHOSPHORUS PENTACHLORIDE. Koritta, J., and A. Franek. *Hutn. Listy*, 1958, XIII, No. 12, pp. 1081-1086.

MT 17 ESSENCE OF THE CREEP RESISTANCE OF MODIFIED 12 PER CENT. CR STEELS. Koutsky, J. *Hutn. Listy*, 1959, XIV, No. 11, pp. 951-955.

BCIRA 9 USE OF CALCIUM CARBIDE IN CUPOLAS. Schulze, R. *Giesserei*. 1958, **45**, September 14, pp. 542-45.

PS: CR-2694 GRAPHITE CASTING MOULDS. Sosnenko, M. N. *Lit. Proizv.*, 1958 (10), pp. 6-7. ($3.85.)

BCIRA 5 GRAPHITE FORMATION IN IRON-CARBON ALLOYS. Wittmoser, A. Proceedings of the 25th International Foundry Congress, Liege, 1958, pp. 461-82.

Symbols for sources of translations:—

ADA: Aluminium Development Association, 33, Grosvenor Street, London, W.1. BCIRA: British Cast Iron Research Association, Bordesley Hall, Alvechurch, Birmingham. MT: M. de O. Tollemache, The Old Rectory, Lewknor, Oxon. PS: Primary Sources, 11, Bleecker Street, New York, N.Y., USA.

Personal

Mr. J. PRENTICE has been elected president of the New South Wales division of the Institute of Australian Foundrymen.

Dr. A. H. SULLY, director of the British Steel Castings Research Association, Sheffield, has been elected to the Council of the Institution of Metallurgists.

Dr. R. B. NICHOLSON has been appointed demonstrator in the Department of Metallurgy, Cambridge University, with a tenure of three years from October 1.

Mr. C. GILBERT SMITH has become an executive director of Raleigh Industries, Limited. He has resigned from the board of Enfield Cycle Company, Limited.

Mr. GEOFFREY HULME, a works chief inspector at Vulcan Foundry, Limited, Newton-le-Willows (Lancs), has been elected as a Liberal member of Golborne Council.

Mr. P. J. COCKRAM, secretary and chief accountant of John Lysaght's Scunthorpe Works and the Scunthorpe Rod Mill, has been appointed a director of both companies.

Mr. WILLIAM S. RISK has been elected president of the Institute of Cost and Works Accountants. Mr. F. M. W. HIRD and Mr. WILLIAM BISHOP have been elected vice-presidents.

Mr. COLIN CAMPBELL MITCHELL, director of research and development with Brown Bros. & Company, Limited, Edinburgh, has agreed to join the board of Bruntons (Musselburgh), Limited.

At a meeting in London of the executive council of the Shipping Federation, Sir DONALD ANDERSON was re-elected chairman of the Federation. Colonel W. L. DENHOLM was re-elected vice-chairman.

Nurse MCINTYRE of Allied Ironfounders, Limited, has retired after 37 years' service with the firm. Presentations, on behalf of her colleagues, were made to her by a fellow-employee, Mr. T. Miller.

Mr. C. T. HILL has been appointed chairman of H. J. Enthoven & Sons, Limited, lead smelters and refiners, as from June 30 in succession to Mr. A. M. BAER, who has retired in order to reduce his commitments.

Mr. ST. J. ELSTUB, a director of Amal, Limited, Witton, Birmingham, has been appointed deputy chairman. He is also joint managing director of the metals division of the parent company, Imperial Chemical Industries, Limited.

Sir STUART GOODWIN, the Sheffield industrialist, has given £2,000 towards the £150,000 needed to modernize Darley Dales St. Elphin's School, it was announced by the Duke of Devonshire on May 11, at an appeal meeting attended by industrialists at Chatsworth Hall.

Mr. J. C. SNOW, joint managing director of Snow & Company, Limited, Sheffield, as vice-president of the Machine Tool Trades Association, is to head a committee to co-ordinate plans, with the Department of Scientific and Industrial Research, for the creation of a machine-tool research body.

Mr. PETER R. DYAS has been appointed design and development engineer of the special products division of Chrysler International S.A., in London. Mr. SIDNEY F. HARRISON has been appointed UK field engineer. Mr. JOHN H. SHEARER, applications engineer, and Mr. PATRICK O'FARRELL, draughtsman-application engineer.

Sir CHARLES KEY and Mr. HAROLD T. COLLINSWOOD have been appointed additional directors of Pulsometer Engineering Company, Limited. Sir Charles was at one time Deputy Under-Secretary of State at the War Office. Mr. Collinswood is an executive director of Foster Wheeler, Limited. Mr. NORMAN TETLOW has resigned from the board of the company.

BTR Industries, Limited, announce the appointment of Mr. F. S. LLOYD as purchasing officer for the BTR Group. For the last five years purchasing officer for the Crompton Parkinson Group of Companies, Mr. Lloyd previously held senior buying appointments with Mullard Equipment, Limited, and Marconi Instruments, Limited. He has for many years been active in the Purchasing Officers Association, taking a leading part in that Association's work in connection with education for supply management in industry.

Mr. W. E. BARDGETT, research manager of United Steel Companies, Limited, Sheffield, has been elected president of the Institution of Metallurgists, of which he has been a Fellow for 14 years, and a vice-president since 1957. Mr. Bardgett took charge of the metallurgical section of United Steel Companies, under the late Dr. T. Swinden, in 1933 after serving with Colville's. He was awarded the Sir Robert Hadfield Medal of the Iron and Steel Institute some years ago, and was president of the Sheffield Metallurgical Association in 1941.

Davy & United Engineering Company, Limited, Darnall, Sheffield, announce the following staff changes. Mr. FREDERICK G. PHIPPS, who is due to retire next year, has relinquished his appointment as director in charge of production, but, until retirement remains a director. He also retains his directorships of Davy & United Roll Foundry, Limited, and of Davy & United Instruments, Limited. Mr. Phipps has spent the whole of his working life in the steelworks plant industry on which he is now a recognized authority. Mr. STEPHEN BAKER, previously works manager at the Darnall works, has been appointed production director in succession to Mr. Phipps, and Mr. WALTER HATCHER, manager of the machine and erecting shops at the Darnall works, succeeds Mr. Baker.

A number of gifts have been made to Mr. RICHARD MILES, former chairman of Head, Wrightson & Company, Limited, Thornaby-on-Tees, who joined the firm in 1932 and retired last January, though he is continuing as a non-executive director of the firm. The gifts, including a gold cigarette-case, a silver tea-service and a condiment set, were presented to Mr. Miles by Sir JOHN WRIGHTSON, the new chairman, on behalf of the directors and management. On behalf of the employees, Mr. FRANK SHEPHERD, personnel manager, and Mr. A. D. MUIR, vice-chairman of the employees' council, handed over a pair of silver candelabra, and Mr. R. N. ALLISON, secretary of the Head Wrightson group of companies, presented Mr. Miles with a painting—a gift from the South African branch.

Mr. G. F. SHORE, who is over 90, recently made a 160-mile car journey from Hampshire to be present at the W. & T. Avery, Limited, annual reunion of workers at Smethwick. He has been present at most of these gatherings since their commencement in 1946, and this time was driven to Smethwick by his wife, who is also an old employee. Mr. Shore commenced work at the age of 14 as an apprentice with Henry Pool & Son, Liverpool, which firm was later taken over by W. & T. Avery, and retired in 1943 as an assistant secretary of the company. His son, Mr. ALAN SHORE, has been with the company for 40 years, and is now superintendent of the foundries. Mr. A. Morley, chairman of the firm, welcomed a record gathering of 134 men and women, whose service with W. & T. Avery averaged about 35 years each, to the reunion.

Company News

WADKIN, LIMITED, manufacturers of woodworking machinery and pattern-shop equipment, of Leicester—Group profit for 1959 was £153,366 (£159,913), after tax of £151,850 (£151,725), and the final dividend of 6 per cent. makes 10 per cent. for the year (9¼ per cent. equivalent).

THOS. FIRTH & JOHN BROWN, LIMITED—An interim dividend of 5 per cent. on account of the year ending September 30, 1960, is to be paid on capital increased by a one-for-four scrip issue—an effective rise of 1.8 per cent. The 1958-59 final dividend was 6 per cent. on the present capital.

COWLISHAW, WALKER & COMPANY, LIMITED, ironfounders and manufacturers of coal-face machinery, and power presses, of Stoke-on-Trent—Dividend for 1959 is 20 per cent. on capital increased by a one-for-three scrip issue (15 per cent. equivalent). Net profit, after tax, dropped to £112,419 (£135,191).

J. BROCKHOUSE & COMPANY, LIMITED, drop forgers, ironfounders, etc., of West Bromwich—Interim dividend is raised to 4 (3) per cent. for the year to September 30, 1960. The previous year's final was 7 per cent. For the half-year to March 31, 1960, estimated profit, before tax, is £544,874 against £368,545 for the corresponding period last year.

C. C. WAKEFIELD & COMPANY, LIMITED, manufacturers of lubricating oils and equipment, of London, W.1—The dividend is raised to 2s. 9d. (2s. 3d.) a 10s. unit with a final of 2s. for 1959. A one-for-two scrip issue is proposed. Consolidated net profits rose from £1,467,035 to £1,834,813, after tax of £1,648,539 (£1,572,937). The company proposes changing its name to Castrol, Limited, as from August 2.

HAWKER SIDDELEY GROUP, LIMITED—Next accounts will cover the 17 months to December 31, 1960, for which period it is expected to pay dividends totalling 15 per cent., against 10 per cent. for the previous year to July 31, 1959. For the current 17 months it is expected to pay two interim dividends, each of 5 per cent., with a final of not less than 5 per cent. Sir Thomas Sopwith, the chairman, states that group results for the current year should not be disappointing.

YARROW & COMPANY, LIMITED, shipbuilders and engineers, of Glasgow—The directors are to recommend that the authorized and issued capital should be increased from £750,000 to £1,000,000 by the creation of 250,000 6½ per cent. cumulative preference shares of £1 and that £250,000 of the general reserve be capitalized and applied in paying up in full such shares, each member to receive one for every three ordinary shares held at the close of business on June 30. The first half-yearly dividend of 3¼ per cent. is to be paid on December 31.

British Association Annual Meeting

The 122nd annual meeting of the British Association for the Advancement of Science will be held in Cardiff from August 31 to September 7 under the presidency of Sir George Thomson, FRS, Master of Corpus Christi College, Cambridge. The title of his presidential address will be "The Two Aspects of Science." The association is visiting Cardiff this year for the third time, previous meetings having been held there in 1891 and 1920.

Export Licences for Certain Types of Non-Ferrous Scrap

The Board of Trade announces that it is prepared to consider applications to export 90 per cent. by weight of the usable metal content of imported non-ferrous metal scraps, wastes and residues which, after importation, have been subject to processing, such as sorting and cleaning, but not remelting in the United Kingdom, on the following conditions:—

(*a*) that the Board of Trade (Industries and Manufactures Department, Division 4) or in the case of aluminium, magnesium and titanium scrap, wastes and residues, the Ministry of Aviation (Air A.2 (LM) Department), are consulted in advance about any proposed transaction concerning the import of non-ferrous metal scraps, wastes and residues for re-export after processing and before any arrangements for purchase or sale are made;

(*b*) that documentary evidence is produced to show that the material has been imported (*e.g.*, certified true copy of the Customs entry);

(*c*) that a certificate is produced to show that the material to be exported is derived from the imported scrap, and

(*d*) that a statement is given showing how the balance of the imported material is being sold to customers in the United Kingdom.

Enquiries concerning this notice should be addressed to the Industries and Manufactures Department, Division 4, Board of Trade, Horse Guards Avenue, Whitehall, S.W.1 (telephone: TRAfalgar 8855, extn. 7684), or in the case of aluminium, magnesium and titanium scrap, wastes and residues to the Ministry of Aviation, Air A.2 (LM), St. Giles Court, 1-13, St. Giles High Street, W.C.2 (telephone: MUSeum 3644, extn. 750).

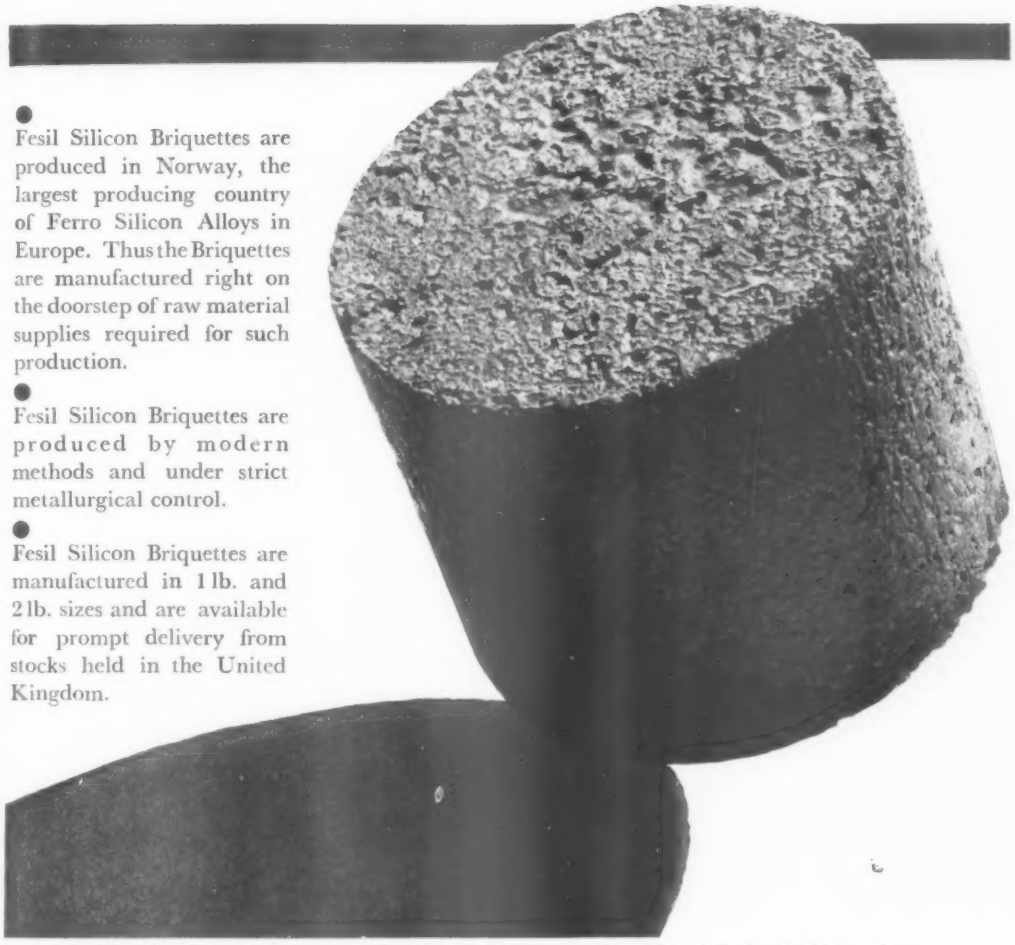
Newton Chambers' Record Turnover

Newton Chambers & Company, Limited, Thorncliffe, Sheffield, report that their engineering division achieved a record turnover and profit last year despite the continuing reduced demand for capital plant by the basic industries. They state that the results achieved were largely due to the diversification of the division's activities, made possible by the re-equipment and extension programme carried out in recent years. Despite the tendency of the market for the traditional type of fireplace to decline, the demand for Redfyre appliances continued at a high level. This was due partly to the introduction of new models and to the successful launching of the Redfyre Centramatic oil-fired water-heaters, for which new manufacturing facilities have been provided.

The order position of the Centramatics is very satisfactory and the redesign of the firm's solid-fuel appliances to meet changing tastes has also had its effect. It is expected that the effect of the Clean Air Act will be to increase the demand for both the solid-fuel and oil-fired domestic appliances produced by the department. The firm claims that there is no risk of fire involved in this type of oil-burning water-heater.

The group's gross trading profit, before charging depreciation, was £1,466,671 compared with £1,293,926. The improved trading position justified an increase in the dividend from 16 per cent. to 17 per cent., so that a final of 11½ per cent. was recommended.

FESIL SILICON BRIQUETTES



- Fesil Silicon Briquettes are produced in Norway, the largest producing country of Ferro Silicon Alloys in Europe. Thus the Briquettes are manufactured right on the doorstep of raw material supplies required for such production.
- Fesil Silicon Briquettes are produced by modern methods and under strict metallurgical control.
- Fesil Silicon Briquettes are manufactured in 1 lb. and 2 lb. sizes and are available for prompt delivery from stocks held in the United Kingdom.

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MANUFACTURERS OF MANGANESE, SILICO-MANGANESE AND OTHER FERRO ALLOY BRIQUETTES

News in Brief

THE INSTITUTION OF GAS ENGINEERS will hold their 97th annual general meeting in Edinburgh this year, from May 31 to June 3.

AN EXTENSION to their pressure-vessel shop is to be built by the Motherwell Bridge & Engineering Company, Limited, at at cost of £100,000.

THE MANGANESE BRONZE & BRASS COMPANY, LIMITED—Lt.-Col. S. J. M. Auld has resigned from the board of which he has been a member since 1946.

INDUSTRIAL GALLERY was opened at the National Museum of Wales in Cardiff on Wednesday of last week. It aims to provide a record of technical progress in Wales and its influence on the life of the people.

THE ADMIRALTY has ordered 40 self-regulating 500 kVA transformers from Foster Transformers, Limited, a member of the Metal Industries, Limited, group. The contract is worth £64,000 and first deliveries will be made early in August.

A CONSIGNMENT OF MOULDING SAND from Mansfield has been sent to the Antarctic for use at a whaling station. This station has a small foundry, where castings and bearings are made for use in the whaling ships and in shore installations.

A NEW COMPANY, Northern Trailer Company, Limited, formed in January last, has gone into production at Bishipbriggs, Glasgow, making trailers in the 10- and 17-ton range incorporating all types of mechanical, vacuum and air-pressure brakes.

IN REPORTING the annual meeting and luncheon of the British S.G. Iron Producers' Association (May 12 issue), a nought was dropped from the figure quoted for the production of s.-g. iron castings in 1959—the correct total is 315,000 tons. The JOURNAL offers apologies to all concerned.

NEW LABORATORIES, costing £500,000, at the Harlow (Essex) factory of Associated Electrical Industries, Limited, were opened on Tuesday by Lord Chandos, chairman of AEI. Among activities there will be work on apparatus for increasing the usefulness of electron microscopes and devices for amplifying weak light signals.

FIRST QUARTER SALES and operating revenues of Aluminium, Limited, amounted to $124,632,000, an increase of 31 per cent. from $95,100,000 in the corresponding period of 1959. Consolidated net income for the three months ended March 31 was $8,804,000, or 29 cents a share, compared with $2,310,000, or 8 cents a share, for the 1959 period.

THE 1960 ANNUAL ASSEMBLY of the International Institute of Welding is being held in Liège, between June 12 and 18. Meetings of all commissions will take place, and a series of evening lectures by international experts on the welding of thick material have been arranged. One of these lectures is to be given by Dr. H. Harris of the United Kingdom.

BOTH THIN AND THICK steel chrome plated cylinder liners for a range of commercial vehicle and industrial engines are now being produced by Sheepbridge Stokes, Limited, of Chesterfield, a member of the Sheepbridge Engineering Group. Conversion kits will soon be available, comprising cylinder liners, pistons complete with rings, and gudgeon pins.

REVIEWING trading results of the first six months of the company's fiscal year, to the end of April, Mr. A. A. Thornbrough, president, said that Massey-Ferguson (United Kingdom), Limited, had sold more tractors than any other manufacturer in the United Kingdom to the domestic and the export markets combined. In that period about 38,500 M-F tractors had been sold.

BAKER PERKINS, LIMITED, Westwood Works, Peterborough, have used a four-page leaflet entitled "Before and After" to stress the fact that they operate pre- and post-sales service-depots in Glasgow, Newcastle, Belfast, Leeds, Manchester, Dublin, Birmingham, Cardiff, London and Exeter. These depots cater for the foundry, chemical and plastics industries, and their full addresses are quoted in the leaflet.

THE RECENT INSTALLATION and commission of a 3-roll cold-plate bending machine at the Erith Engineering Works of the General Electric Company, Limited, enables the company to bend mild-steel plate up to 4¾-in. thick. This is believed to be the largest machine of its type in this country, and its installation places the company in a position to bend the thickest plate likely to be encountered in pressure-vessel work.

A NEW DIVISION, Site Shotblasting (Gt. Britain), Limited, has been formed by R. J. Richardson & Sons, Limited, Commercial Street, Birmingham 1, to take care of shotblasting on site of work too large to be catered for by transport into the company's works. The new division will cover internal cleaning of large-bore pipes, oil tanks, gasometers, bridges, steel chimneys, etc. The internal and external cleaning of ships' hulls will also be undertaken, and in particular the tanks of oil tankers.

A RECORD OUTPUT of 2,704 tons of ingot moulds, bottom plates, slag ladles and general engineering castings was produced in the iron foundry of Distington Engineering Company, Limited, Sheffield subsidiary of United Steel Companies, Limited, during the week ending May 7. This follows an earlier British and European record for an ingot-mould foundry which was set up by Distington in February of this year, when over 2,500 tons of finished castings were produced in one week.

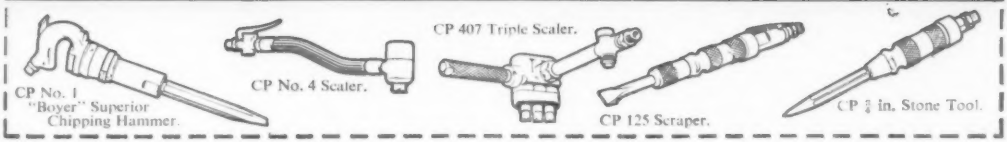
MORE THAN 100 GLASGOW WORKERS will be employed soon on the production of plastics machinery—a new industry for Scotland. Matthew Wylie & Company, Portman Street, Glasgow, are undertaking the manufacture of this equipment under an agreement with a West German firm. They will produce the Fischer range of plastics extruding and blow moulding machinery, and will have an exclusive licence covering its manufacture and sale in Great Britain and the Commonwealth.

STANTON IRONWORKS COMPANY, LIMITED, near Nottingham, announce that the availability of 35 mm. film strips, with booklets of lecture notes, covering the following subjects "Flexible Joints for Use with Cast Iron Pipes and Special Castings"; "Handling of Cast-Iron Pipes"; "The 'Tyton' Joint for Stanton Spun-iron Pipes," and "Laying and Testing Cast-iron Pipes." Applications should be made, and material returned to, the technical library, publicity and publications department, of the company.

DIRECTORS AND EMPLOYEES of the Walsall and Brownhills foundries of Castings, Limited, will be taking a cruise along the River Avon this summer. The invitation for the trip was extended to them by the former chairman of the board, Mr. W. D. Bullows, when he received a presentation of boating equipment to mark his semi-retirement from the company at the end of March. This latter occasion was a buffet dance held in honour of Mr. Bullows and six employees, each of whom had completed 25 years' service with the firm.

The right CHIPPER for the job—and CP make it!

HERE ARE 5 DIFFERENT CP CHIPPERS



One firm needs a tool for chipping away steel from heavy castings. Another for removing paint prior to repainting. Yet another is faced with the removal of heavy scale. And for *all* these jobs—CP can supply the tools.
CP in fact make the right chipper for *every* type of work—from fettling castings to delicate carving on marble—caulking, scraping, cleaning or chasing.
Five of CP's wide choice of chippers are illustrated here; you can see the full range in the CP Chipping Hammers catalogue.

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CP/227

News in Brief

Mr. PETER THOMAS, Parliamentary Secretary to the Minister of Labour, was among the speakers at the Midland region conference of the Institute of Personnel Management, held at Ashorne Hill, Leamington, from May 7 to 8. Another principal speaker was Sir David Watherspon, personnel director of Tube Investments, Limited. The conference, which explored the future of personnel management, was organized by the Wolverhampton and Black Country branch of the IPM, of which Mr. Henry Allen, of the Yale & Towne Company, is chairman.

THE DIRECTORS of Mt. Isa Mines, Limited, have stated that the company will make a one-for-three bonus share issue to its shareholders worth about £30,000,000 in market value. The nominal value is £2,374,891, but the current high premium on Mt. Isa shares makes the issue, in terms of market value, the greatest in Australian financial history. The company has spent over £22,000,000 on a £40,000,000 expansion programme which will lift daily ore production to 14,400 tons. This year, production has increased steeply to nearly 8,000 tons daily.

AS PREVIOUSLY ANNOUNCED, the shares of Almin, Limited, the parent organization for Fulmer Research Institute, Limited, have been acquired jointly by Imperial Chemical Industries and the Aluminium Company of America (ALCOA). It is not expected that the change of ownership will affect the position of the Fulmer Research Institute as an independent institution for carrying out sponsored research and the new owners of Almin, Limited wish it to be clearly understood that all work undertaken at Fulmer Research Institute will remain strictly confidential to the sponsors.

A NEW UNDERTAKING, Charles W. Ireland (Aluminium), Limited, Burnbank, Hamilton, metallurgists and metal merchants, has been formed to increase Scottish capacity for producing aluminium ingots to customers' own requirements. The firm's refinery is now in commercial production, working on substantial orders from England. The chairman is Mr. Duncan Ireland, of Charles W. Ireland & Son, also of Burnbank, an established firm of engineers and metal merchants. This latter firm will handle buying and sales, leaving the new concern to concentrate on technology and production.

THE FOURTEENTH CONGRESS of the International Scientific Film Asociation is to be held in Prague from September 16 to 24, and will include, as in previous years, a festival of films presenting science. Responsibility for selecting the British film entry for the Congress rests with the Scientific Film Association of Great Britain. Organizations in this country with films or film material which they wish to be considered in this connection are asked to make contact as soon as possible with the SFA, 3, Belgrave Square, London, S.W.1 (BELgravia 6188), from whom further particulars may be obtained.

THE DUNDEE FACTORY of Astral Equipment, Limited, owned by Morphy-Richards, Limited, and employing 2,000 people, is to be doubled in size by an extension at Kingsway industrial estate. The new works is already being built, and should be ready next year. Mr. F. B. Bishop, chairman of Morphy-Richards, states that the reason for the expansion is the increasing demand for the firm's refrigerators, which are made in Dundee, and some of which go to many countries abroad, including the USA. Astral Equipment was taken over by Morphy-Richards in 1955, and has of late been rapidly increasing in production.

AT A MEETING of the Greater Birmingham Employment Committee last week (ended May 14) it was stated that the Midlands labour shortage is steadily worsening as a result of industrial expansion. Figures from the Ministry of Labour show that unemployment in the Midland region stands at the low level of 19,944. Employers are recruiting labour from other parts of the country and Mr. A. C. Cox, secretary of the Committee, said that more firms are prepared to accept coloured workers. Mr. C. J. German, Regional Controller of the Ministry of Labour, stated that the unemployment in the area was 0.72 compared with the national average of 1.8.

A THREE-DAY CONFERENCE on "Ergonomics" is being organized by the Department of Scientific and Industrial Research at the Connaught Rooms, Great Queen Street, London, W.C.2, from September 27 to 29. Speakers at the conference, from industrial concerns, medical services, trade unions and academic institutions, will discuss the benefits to industry of a combined approach by anatomists, physiologists and psychologists, along with engineers, to the problems of "fitting the man to the job." Further details are obtainable from Miss H. M. Clay, DSIR, 14-18, Cornwall Terrace, Regent's Park, London, N.W.1. As accommodation is limited, early application is recommended.

AT A SPECIAL MEETING of the Birmingham Chamber of Commerce on May 17, Mr. H. Eccles-Williams, managing director of Rabone, Peterson & Company, and chairman of the National General Export Merchants' Group, predicted that British exports to Egypt would soon be restored to the 1956 level of £2,000,000. The Birmingham meeting had been convened to hear a report from Mr. Eccles-Williams and Mr. K. E. Mackenzie, assistant secretary to the Board of Trade, on the findings of the recent British trade mission to the United Arab Republic. Both speakers had been members of the mission. They said that the reputation held by British goods was very high. Headway made by Western Germany in usurping Britain's trade position in Egypt would make a return to former trade levels difficult and the Eastern *bloc* had also been very active, but there was a strong wish in places such as Cairo and Alexandria to do business with Western Europe. The mission it was stated had invited the UAR Government to send a reciprocal mission to the UK.

Obituary

Mr. WILLIAM M. GRAINGER, secretary of the Halesowen firm of Walter Somers, Limited, died on May 10 at the age of 45. He joined the firm in 1946, was appointed secretary seven years later, and became a director last November.

The death has occurred of Mr. HENRY G. SMITH, chairman of George Hattersley & Sons, Limited, manufacturers of textile and weaving machinery, of Keighley (Yorks). He was 68 and had been a director of the company for nearly 50 years.

Mr. HENRY GIFFARD SMITH, chairman of George Hattersley & Sons, Limited, loom makers, North Brook Works, Keighley, has died at the age of 68. He had been a director of the company for nearly half a century and chairman for the past eight years.

Mr. STANLEY DALKIN HODGSON, technical director of the Tees-side Bridge and Engineering Works, Limited, Middlesbrough, has died at the age of 50. He began his apprenticeship with Bolckow Vaughan and moved to the Tees-side Bridge and Engineering Works in 1927. Rising from draughtsman to assistant manager, he was appointed technical director 18 months ago.

ABERDEEN FOR ANGUS

Photo by The Scottish Farmer

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Raw Material Markets

Iron and Steel

High production of basic steelmaking pig-iron is maintained and record outputs at furnaces are fully absorbed by steelworks. With the increasing scarcity of the better quality of scrap, stocks of basic pig-iron at furnaces and steelworks have been reduced considerably and in some areas available supplies are barely sufficient to meet demands; deliveries from other home sources are relieving this position to some extent and also help to meet the heavy requirements.

The overall supply of foundry grades of pig-iron are adequate for all consumers, and apart from delays through lack of stocks and dependence on production at furnaces, foundries are well covered for their stock and consumption supplies. The biggest demand, comparatively, still comes from engineering and speciality foundries for low phosphorus foundry irons, and consumers can get all they require, although many have to accept alternative brands. Substantial tonnages of readily-available hematite are also being used by these foundries, together with refined irons.

The high phosphorus iron used mainly by the light, jobbing, textile, and some engineering foundries is in good supply and overseas buyers relieve producers of some of the excess tonnages.

The call for high quality castings from engineering and speciality foundries is still high. The motor vehicle industry continues to indent for large tonnages and the machine tool trade is calling for increased quantities of castings. Many other important industries are using large tonnages of high-duty castings.

The demand for builders' castings is maintained and there is also a good demand from the domestic utensil trade. The light foundries catering for them are enjoying reasonably good outputs. Jobbing and textile foundries could also undertake more work.

Foundries are fairly well covered for their scrap requirements, although there is a good demand for the better and heavier grades of steel, cast-iron, and machinery scrap. Foundry coke deliveries are satisfactory and ganister, limestone, and firebricks are available.

The re-rollers are well placed for all products and the good demand for small bars, light sections, and reinforcing rods continues. Orders will keep them occupied for some time although capacity outputs are not always possible because of scarcity of steel semis and suitable labour.

Home steelworks continue to supply the re-rollers with substantial tonnages of billets, blooms, etc., and although there has been some improvement recently, except for 2-in. billets, demands are not met fully Imported consignments will relieve this position particularly for 2-in. billets. All arisings at the steelworks of suitable re-rolling defectives and shorts are readily accepted.

Non-ferrous Metals

The London copper market is in a stubborn mood and despite important events directly affecting the market, prices have shown surprising reluctance to move very far in any direction. Indeed, it may have been thought that the collapse of the Summit would have brought about increased consumer activity to build up stocks, but little new interest has been in evidence.

Similarly, the collapse of the latest round of negotiations in the Chilean strike has made no real impact on LME prices. In short, no definite trend has yet emerged and is not likely to until the Chilean situation is settled. The 24-hour strikes were suspended at the last moment, due, it is understood, to the recent earthquakes in central and southern Chile which have changed the attitude of the workers. However, nothing is settled and until it is consumer interest is apt to be neutral. Meanwhile, stocks of refined copper in LME warehouses continued to mount at the end of last week and totalled 3,918 tons, a rise of 429 tons.

In the US the price of 33 cents a pound is still applicable to custom smelters and for producers, who are experiencing satisfactory demand. The current price of scrap is 24½ cents a pound at which level offerings are on a limited scale.

The tin market is uneventful, awaiting the outcome of the United Nations Tin Conference now in session in New York where the draft of a proposed new International Tin Agreement to come into effect on July 1 is being debated. In London, the market is featureless and with stocks at the end of last week totalling 8,179 tons, a contango has been established for the first time for over six months. The market in the East is also quiet and demand leaves something to be desired in New York where the price is still fractionally below $1 a pound.

Lead continues to be a firm market and prices are holding up well at over £78 a ton. In the US, demand is satisfactory and is being helped not only by the stoppage of work at the Bunker Hill Mine in Idaho but also by the threat of a strike in the lead and zinc properties of the American Smelting & Refining Company. The US price is unchanged at 12 cents a pound.

Zinc has turned quiet in London and in the States where steel production continues to decline. In London the supply position is very much better and a contango has been established. The East St. Louis spot price is unchanged at 13 cents a pound.

Recent Wills

WADE, CHARLES, director of Josiah Wade, Limited, printers' engineers, of Halifax £73,539

MOSZYNSKI, DR. Z. K. A., principal scientific officer of the British Coke Research Association ... £4,433

DEWHURST, WILLIAM, engineering division's sales representative for Newton, Chambers & Company, Limited, Thorncliffe, near Sheffield £3,886

BOTWOOD, B. A., former sales and service director of the Rover Company, Limited, managing director of Harry Ferguson, Limited, and one time managing director of Humber, Limited ... £32,046

ALLEN, H. G., deputy chairman and managing director of W. H. Allen Sons & Company, Limited, mechanical, hydraulic, and electrical engineers, of Bedford, until his retirement in June, 1959 ... ... £226,009

DAVIES, J. W., former director of the Hollinwood works of Ferranti, Limited, past president of the Manchester district of the Engineering Employers' Association, and a founder member of the Institution of Production Engineers £30,130

Head Wrightson Machine's £700,000 German Order

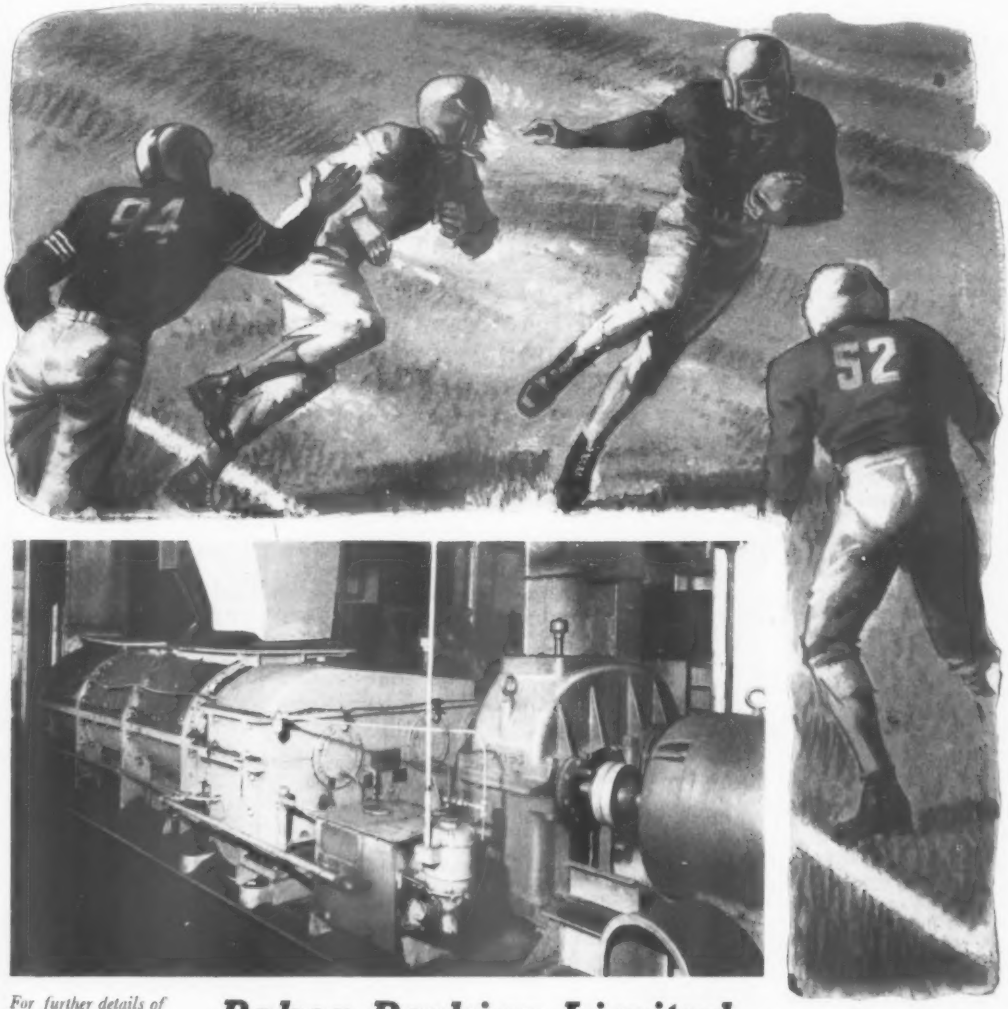
Provision of all the equipment for a complete billet mill has been ordered by Maschinenfabrik Sack, Gmbh. of Düsseldorf, from the Head Wrightson Machine Company, Limited, a subsidiary of Head Wrightson & Company, Limited. The contract is worth about £700,000 and includes the intermediate roller tables, cooling banks, and mill drives.

The equipment is to be installed at the Redbourn Works of Richard Thomas & Baldwins, Limited, from whom the Düsseldorf company has received a contract for the supply of the complete mill.

BAKER PERKINS FOUNDRY TEAM

-proved unbeatable in U.S.A.

The photograph below shows one of eight matched Baker Perkins units chosen to provide all the mixing requirements for an automotive grey iron foundry in the U.S.A. A strong line of five B-P (150 tons per hour) 5A Continuous Moulding Sand Mullers delivers consistently uniform sand into the moulding shop.
Behind them a B-P Core Paste Mixer and a B-P Core Wash Mixer ensure excellent core surfaces. Centre of the team is the B-P Refractory Clay Mixer for lining ladles and cupolas.
After four years of gruelling operation this B-P equipment has proved itself in all respects. It is built to do a rugged job consistently and with minimum maintenance.



For further details of this and other foundry machinery write to:

Baker Perkins Limited, *Engineers*

BEDEWELL DIVISION, HEBBURN-ON-TYNE, Co. DURHAM.

Tel. Jarrow 897124

BPF9

Current Prices of Iron, Steel, and Non-ferrous Metals

(Delivered unless otherwise stated)

May 25, 1960

PIG-IRON

Foundry Iron.—No. 3 IRON, CLASS 2, 10-ton lots or over: Middlesbrough, £21 6s. 0d.; Birmingham, £20 18s. 3d.

Low-phosphorus Iron.—Over 0.10 to 0.40 per cent. P, 10-ton lots or over, £23 5s. 0d., delivered Birmingham, £23 10s. 0d., delivered Grangemouth.

Cylinder and Refined Irons.—North Zone, £25 6s. 6d.; South Zone, £25 9s. 0d.

Refined Malleable.—P, 0.10 per cent. max.; North Zone, £26 6s. 6d.; South Zone, £26 9s. 0d.

Hematite.—Si up to 2 per cent., S. & P. over 0.03 to 0.05 per cent., 10-ton lots or over: N.-E. of England (local iron), £23 19s. 0d.; Scotland (Scotch iron), Zone S.1, £24 5s. 6d.; Sheffield, £25 7s. 6d.; Birmingham, £25 14s. 0d.; Wales (Welsh iron), £23 19s. 0d.

Basic Pig-iron.—£20 3s. 0d., delivered Staffs, Derbyshire, Notts, Lincs, Rutland, Northants, and Leicestershire in 10-ton lots or over.

FERRO-ALLOYS

(Per ton unless otherwise stated, delivered)

Ferro-silicon (6-ton lots and over).—45 per cent. Si, £41 10s. 0d. to £44 0s. 0d., scale 15s. 0d. per unit, lumpy; 75 per cent. Si, £57 0s. 0d. to £62 10s. 0d., scale 15s. 0d. per unit, lumpy.

Ferro-vanadium.—50/60 per cent., 22s. 6d. per lb. of V.

Ferro-molybdenum.—65/70 per cent., carbon-free, 12s. 10d. per lb. of Mo.

Ferro-titanium.—20/25 per cent., 2-3 per cent. Cu, £250 0s. 0d.; 38/40 per cent., commercially carbon-free, £287 0s. 0d.

Ferro-tungsten.—80/85 per cent., 11s. 9d. per lb. of W.

Tungsten Metal Powder.—98/99 per cent., 14s. 9d. per lb. of W.

Ferro-chrome (6-ton lots and over, lumpy).—4/6 per cent. C, £78 10s. 0d. to £82 10s. 0d., basis 60 per cent. Cr. scale 26s. 0d. to 28s. 6d. per unit; over 6 per cent. C, £77 0s. 0d. to £80 10s. 0d., basis 60 per cent. Cr, scale, 26s. 0d. to 28s. 6d. per unit; 2 per cent. C,* 1s. 8d. to 1s. 11d. per lb. Cr; 1 per cent, C,* 1s. 8½d. to 1s. 11½d. per lb. Cr; 0.15 per cent. C,* 1s. 9½d. to 2s. 0½d. per lb. Cr; 0.10 per cent C,* 1s. 9½d. to 2s. 0½d. per lb. Cr; 0.06 per cent. C,* 1s. 10½d. to 2s. 1d. per lb. Cr.

Metallic Chromium.—98/99 per cent., 6s. 10d. per lb.

Metallic Manganese.—94/96 per cent., carbon-free, £275 0s. 0d.; 9 6/98 per cent., £285 0s. 0d.

Ferro-columbium.—65/67 per cent., Cb + Ta, 19s. 9d. per lb., Cb + Ta.

Ferro-manganese (Standard).—78 per cent., £61 10s. 0d.

SEMI-FINISHED STEEL

Re-rolling Billets, Blooms, and Slabs.—BASIC: Soft u.t., 100 tons & over, £31 15s. 6d.; tested, 0.08 to 0.33 per cent. C, 6 to 35 tons, £33 15s. 6d.; hard (0.41 to 0.60 per cent. C), under 10 tons, £34 17s. 0d.; silico-manganese, under 10 tons, £43 16s. 6d.; free-cutting, under 10 tons, £36 14s. 6d. SIEMENS MARTIN ACID (under 10 tons): Up to 0.25 per cent. C, £41 1s. 0d.; silico-manganese, £44 4s. 0d.

Billets, Blooms, and Slabs for Forging and for Stamping (under 10 tons).—Basic, soft, up to 0.33 per cent. C, £38 10s. 0d.; basic, hard, over 0.41 up to 0.60 per cent. C, £39 12s. 6d.; acid, up to 0.25 per cent. C, £43 4s. 0d.

FINISHED STEEL

Heavy Plates and Sections (1 ton to 10 tons).—Ship plates (N.-E. Coast), £41 12s. 0d.; boiler plates (N.-E. Coast), £44 2s. 0d.; floor plates (N.-E. Coast), £43 10s. 0d.; angles (N.-E. Coast), £38 16s. 6d.; joists (N.-E. Coast), £38 12s. 6d.

Small Bars, Sheets, etc.—Rounds and squares, under 3 in., and flats 5 in. wide and under, untested soft basic, 50 tons and over, £39 1s. 0d.; under 10 tons to 4 tons, £40 18s. 0d.; under 4 tons to 2 tons, £41 3s. 0d.; hoop and strip, coils, 100 tons and over, £38 0s. 0d.; uncoated strip mill coils, hot rolled, under 3 mm. to 12g., 25 tons to under 50 tons, £43 16s. 0d.; black sheets (hand mill), 24g., 10 tons and over. £57 14s. 6d.; galvanized corrugated sheets, 24g., 10 tons and over, £68 5s. 0d.

Alloy Steel Bars.—1 in. dia. and up: Nickel, £67 17s. 0d.; nickel-chrome, £98 11s. 0d.; nickel-chrome-molybdenum £111 4s. 0d., in lots of 5 tons to under 10 tons.

NON-FERROUS METALS

Copper.—Cash, £240 10s. 0d. to £241 0s. 0d.; three months, £239 15s. 0d. to £240 0s. 0d.; settlement, £241 0s. 0d.

Copper, Tubes, etc.—Solid-drawn tubes, 2s. 4¾d. per lb.; rods, 264s. 6d. per cwt. basis; 20 s.w.g., 299s. 6d. per cwt.

Tin.—Cash, £782 0s. 0d. to £783 0s. 0d.; three months, £783 0s. 0d. to £783 10s. 0d.; settlement, £783 0s. 0d.

Lead (Refined Pig).—Second half May, £77 10s. 0d. to £77 12s. 6d.; second half August, £77 2s. 6d. to £77 5s. 0d.

Zinc.—Second half May, £90 12s. 6d. to £90 17s. 6d.; second half August, £91 0s. 0d. to £91 2s. 6d.

Zinc Sheets, etc.—Sheets, 15g. and thicker, all English destinations, £126 12s. 6d.; rolled zinc (boiler plates), all English destinations, £124 7s. 6d.; zinc oxide (Red Seal), d/d buyers' premises, £105 0s. 0d.

Brass Tubes, etc.—Solid-drawn tubes, 1s. 11⅞d. per lb.; sheets to 10 w.g., 217s. 3d. per cwt.; wire, 2s. 9⅞d.; rolled metal, 217s. 3d. per cwt.

Brass (Brazing).—BS1400, B3, £170; B6, £222.

Brass (High Tensile).—BS1400, HTB1, £198; HTB2, £220; HTB3, £232.

Gunmetal.—BS1400, LG2, £212; LG3, £221; G1, ½%, £277; G1, 1%, £263.

Phosphor Bronze.—BS1400, PB1 (AID released), £309; BS1400, 90/10/1, £289.

Leaded Phosphor Bronze.—BS1400, LPB1, £233.

Phosphor Bronze Strip, etc.—Strip, 306s. 3d. per cwt.; wire, 4s. 2¾d. per lb.; rods, 3s. 5½d.; tubes, 3s. 5½d.; chill cast bars, solids 3s. 5½d.; cored 3s. 6½d. (CHARLES CLIFFORD, LIMITED).

Nickel Silver, etc.—Rolled metal, 3 in. to 9 in. wide × 0.056, 4s. 0d. per lb.; round wire, 10g. in coils (10 per cent.), 4s. 5d.; special quality turning rod, 10 per cent., ½ in. dia., in straight lengths, 4s. 4d. All prices are net.

Other Metals.—Magnesium, ingots 2s. 2½d. to 2s. 3d. per lb, Antimony, English, 99 per cent., £190 0s. 0d. Quicksilver; ex-warehouse, £70 10s. 0d. to £71 0s. 0d. Nickel, £600 0s. 0d. Aluminium. ingots, £186 0s. 0d.; aluminium bronze (BS1400), AB1, £257, AB2, £265.

* Average 68–70 per cent.

Increases in Capital

DAVID G. LEWIS (BIRMINGHAM), LIMITED, engineers, etc., of Birmingham, increased by £35,000, in £1 ordinary shares, beyond the registered capital of £10,000.

BLACK-CLAWSON INTERNATIONAL, LIMITED, engineers, etc., of London, W.1, increased by £350,000, in 2s. 6d. ordinary shares, beyond the registered capital of £650,000.

CAIRD & RAYNER, LIMITED, engineers, coppersmiths, etc., of London, E.14, increased by £75,000 in 5s. ordinary shares, beyond the registered capital of £150,000.

SPEAR & JACKSON, LIMITED, manufacturers of saws, edge tools, etc., of Sheffield, increased by £295,000, in 5s. ordinary shares, beyond the registered capital of £280,000.

WELLINGTON TUBE HOLDINGS, LIMITED, Great Bridge, Tipton (Staffs), increased by £750,000, in £1 unclassified shares, beyond the registered capital of £1,500,000.

WELLMAN SMITH OWEN ENGINEERING CORPORATION, LIMITED London, S.W.1, increased by £800,000, in £1 ordinary shares, beyond the registered capital of £1,600,000.

SIDLER, LIMITED, mechanical engineers, smiths, etc., of Frimley, near Aldershot, increased by £49,900, in £1 ordinary shares, beyond the registered capital of £100.

R. & M. SUTCLIFFE, LIMITED, engineers' merchants, etc., of Triangle, near Halifax, increased by £9,400, in £1 ordinary shares, beyond the registered capital of £1,000.

ASSOCIATED BRITISH MACHINE TOOL MAKERS (HOLDINGS), LIMITED, London, S.W.1, increased by £400,000, in £1 ordinary shares, beyond the registered capital of £100,000.

BECK & MOSS, LIMITED, electric metallurgists, etc., of Hanley, Stoke-on-Trent, increased by £7,500, in £1 ordinary shares, beyond the registered capital of £2,500.

SAMUEL PLATT, LIMITED, ironfounders, engineers, etc., of Wednesbury (Staffs), increased by £336,100, in £1 ordinary shares, beyond the registered capital of £75,000.

GERMETRIC FORM TOOLS, LIMITED, Balsall Heath, Birmingham, increased by £25,000, in 20,000 ordinary and 5,000 preference £1 shares, beyond the registered capital of £10,000.

G. H. BOWEN, LIMITED, chemical and general engineers, etc., of Burton-on-Trent, increased by £40,000, in £1 ordinary shares, beyond the registered capital of £10,000.

AURORA GEAR & ENGINEERING COMPANY, LIMITED, Sheffield, increased by £250,000, in £1 cumulative redeemable preference shares, beyond the registered capital of £250,000.

BRITISH MANUFACTURERS & RESEARCH COMPANY, LIMITED, engineers, etc., of Grantham (Lincs), increased by £400,000, in £1 shares, beyond the registered capital of £100,000.

GEORGE H. SCHOLES & COMPANY, LIMITED, mechanical and electrical engineers, Manchester, increased by £300,000, in 5s. ordinary shares, beyond the registered capital of £300,000

DELTA METAL COMPANY, LIMITED, London, S.E.10, increased by £1,000,000, in £1 6 per cent. non-redeemable cumulative preference shares, beyond the registered capital of £8,000,000.

F.H. (NEWCASTLE), LIMITED, mechanical and electrical engineers, etc., of Newcastle-upon-Tyne, increased by £47,500, in 1s. ordinary shares, beyond the registered capital of £2,500

N. G. BAILEY & COMPANY, LIMITED, electrical engineers and contractors, etc., of Ilkley (Yorks), increased by £90,000, in £1 ordinary shares, beyond the registered capital of £10,000

RUSHWORTH & COMPANY (SOWERBY BRIDGE), LIMITED, mechanical engineers, etc., of Sowerby Bridge, increased by £29,000 in £1 ordinary shares, beyond the registered capital of £1,000.

JOHN FOLKES GROUP, LIMITED, manufacturers of steel forgings, etc., of Stourbridge (Worcs), increased by £400,000, in 1s. ordinary shares, beyond the registered capital of £600,000.

MICRO SCREW & BOLT COMPANY, LIMITED, manufacturers of and dealers in screws, etc., of Leeds, increased by £3,000 in £1 ordinary shares, beyond the registered capital of £3,000.

THOMAS SMITH & SONS (RODLEY), LIMITED, mechanical and electrical engineers, of Rodley, Leeds, increased by £500,000 in £1 ordinary shares, beyond the registered capital of £250,000.

MUNICIPAL APPLIANCES COMPANY, LIMITED, manufacturers of engines, boilers, machinery, etc., of Preston, increased by £10,000, in £1 ordinary shares, beyond the registered capital of £50,000.

W. F. & L. W. OFFORD, LIMITED, mechanical and general engineers, etc., of Portslade-by-Sea (Sussex), increased by £30,000, in £1 ordinary shares, beyond the registered capital of £10,000.

SUTCLIFFE & WAITE, LIMITED, sheet metal workers, etc., of Radcliffe, Manchester, increased by £18,000, in 3,000 ordinary and 15,000 preference shares of £1 each, beyond the registered capital of £2,000.

EASTWELL & LODDINGTON IRONSTONE COMPANY, LIMITED, Staveley Works, near Chesterfield, increased by £50,000, in 25,000 "A" and 25,000 "B" shares of £1, beyond the registered capital of £50,000.

D. H. & L. PICKARD, LIMITED, dealers in stainless noncorrodible and non-ferrous metals, etc., of London, E.14, increased by £98,000, in £1 ordinary shares, beyond the registered capital of £2,000.

PIG IRON, All Grades
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CLASSIFIED ADVERTISEMENTS

PREPAID RATES: Fifteen words for 7/6 (minimum charge) and 4d. per word thereafter. Box Numbers 2/6 extra (including postage of replies). Situations wanted 2d. per word throughout.

Advertisements (accompanied by a remittance) and replies to Box Numbers should be addressed to the Advertisement Manager, Foundry Trade Journal, John Adam House 17/19, John Adam Street, Adelphi, London, W.C.2. If received by first post Monday advertisements can normally be accommodated in the following Thursday's issue.

SITUATIONS WANTED

PLANT ENGINEER (40), A.M.I.Plant.E., A.M.I.B.F., seeks new position. Comprehensive experience installation, development, maintenance mechanised foundries, machine shops, process plant, etc. Salary envisaged £1,500—£1,800 plus housing. Box PE592, FOUNDRY TRADE JOURNAL.

FOUNDRYMAN (40), M.I.B.F., nine years' managerial experience all aspects ferrous and non-ferrous production, mechanised, jobbing. At present employed Ceylon. Free August, 1960. Seeks position with reputable company. Anything considered. Could represent foundry plant, or allied concern such as refractories, etc. S.E. Asia or elsewhere. All replies to be addressed to Box FO618, FOUNDRY TRADE JOURNAL.

MANAGER, 47, aluminium and magnesium gravity die castings, seeks position. Fair knowledge of pressing castings. Considerable experience gained over 30 years at large foundries. Senior positions held in drawing office, foundry and commercial including senior executive. Residing South East London, anything considered. Box MF441, FOUNDRY TRADE JOURNAL.

ENGINEER, 40. Good background and experience in modern Mechanised Foundries, seeks position as Works or Chief Engineer, M.I.C.E., A.M.I.B.F., etc. Accustomed to full control. Malleable, steel. Box EF635, FOUNDRY TRADE JOURNAL.

ENTERPRISING WORKS MANAGER with 25 years' experience, seeks position in progressive foundry. Fully conversant with departmental organisation, labour control, production costing and estimating in jobbing and repetition work in iron and non-ferrous metals. Box EW658, FOUNDRY TRADE JOURNAL.

FOUNDRY TECHNICIAN (27), experienced in cupola control, sand control, runner and riser systems and trained patternmaker, seeks position with prospects. Box FT657, FOUNDRY TRADE JOURNAL.

FOUNDRY ENGINEER seeks change, age 44. Comprehensive experience, methods, planning of production, plant installation, maintenance, mechanised plants—mec. and elec. West Midland area. Box FE646, FOUNDRY TRADE JOURNAL.

TECHNICAL REPRESENTATIVE with extensive connection in London and Home Counties with large industrial groups wishes to represent a foundry for cast iron non-ferrous die castings etc. Good personal connection commission and part expenses. Box TR640, FOUNDRY TRADE JOURNAL.

SITUATIONS VACANT

METALLURGIST required for Roll Foundry in Midlands. Manufacturing Grain, Alloy Grain, Chill, Indefinite Chill and Steel Base Rolls. Box MR661, FOUNDRY TRADE JOURNAL.

METALLURGICAL CHEMIST required to take charge of laboratory employing people on Chemical and Metallurgical Analysis in connection with a large Iron Foundry situated in a pleasant area of the South Coast. Housing available. Please reply in writing, stating age, experience and salary required. Box ME629, FOUNDRY TRADE JOURNAL.

SITUATIONS VACANT—*contd*

THE
FOUNDRY TRADE JOURNAL
has a
vacancy
for a
SENIOR EDITORIAL ASSISTANT
(in London)

THIS is a permanent and progressive appointment. The successful applicant will be about 35 years of age and will be at present holding a position of active responsibility in the foundry industry. Some experience of technical writing will be an obvious advantage. The initial salary may not exceed £1000 p.a., but future remuneration will match achievement and there is ample opportunity for the right man.

Write, with fullest details of training, experience, and present position to the

Managing Director,
Foundry Trade Journal,
17/19 John Adam Street,
London, W.C.2

SITUATIONS VACANT—*contd.*

SENIOR VACANCY exists in Methods Department of Steel Foundry in North West of England. Applicants should have good knowledge of modern methods, and calculating weights from blue prints. Write stating experience, and salary required to Box SV647, FOUNDRY TRADE JOURNAL.

MANAGER required for Ironfoundry with up to 50 tons weekly capacity. Previous experience in management essential and must give evidence of capacity to produce sound castings and ability to control costs. A good salary will be offered to the right man. Send full particulars of experience, etc., to Box MR651, FOUNDRY TRADE JOURNAL.

CROFTS (ENGINEERS), LIMITED, Empire Works, Thornbury, Bradford, 3, Yorkshire, have vacancy for ASSISTANT STEEL FOUNDRY MANAGER (age 30 to 40 preferred) for Foundry with a weekly capacity of 100 tons machine moulded and jobbing castings (Basic Electric) maximum weight 10 tons. Successful applicant must be capable of assuming full control of Steel Foundry in due course and must, therefore, have the necessary technical qualifications and management experience in steel founding. Write stating age, experience and present position to COMPANY SECRETARY.

Arising from their expansion and re-organisation plan
CATTON & CO. LTD., (Steelfounders) of LEEDS have vacancies to offer as follows:

METALLURGIST—for steel foundry technical control duties, together with development work in both the sand and metallurgical fields. Applicants should have experience in ferrous metallurgy and foundry experience would be an added advantage.

METHODS ENGINEER—for investigational and development work in the field of gating and feeding of steel castings. Steel foundry experience desirable but an enquiring mind, together with initiative and determination to logically pursue shop floor problems, is of great importance.

MOULDING SHOP FOREMAN—for the control of a jobbing moulding shop producing steel castings up to five tons finished weight. Moulding experience, together with the ability to organise and control a team of skilled moulders and closers, is essential.

FETTLING SHOP FOREMAN—for supervisory duties in modern dressing shops catering for castings ranging from 1 lb. to 5 tons in weight. Previous experience in the dressing of castings desirable, but applicants with other types of foundry experience would be considered.

All the appointments carry attractive salaries and non-contributory pension benefits and assistance with housing would be provided, if necessary.

Replies—which will be treated in the strictest confidence—to the TECHNICAL DIRECTOR, CATTON & CO. LTD., CHADWICK STREET, LEEDS, 10.

SITUATIONS VACANT—*contd.*

FOUNDRY FOREMAN required, for foundry in the Rochdale area. Must be fully experienced Moulder able to take complete charge of jobbing foundry. This position offers considerable scope and good salary to the right man. State full history to Box FF650, FOUNDRY TRADE JOURNAL.

ASSISTANT FOREMAN for up to date Core Shop employing skilled male and semi-skilled female labour. Must have experience in the quantity production of small cores. Good salary and prospects. Home Counties Area. Apply Box AF445, FOUNDRY TRADE JOURNAL.

EXPERIENCED ESTIMATOR required for a West Midland Ironfoundry. Applicants should have had experience in weight estimation and estimation of production costs. Please write, giving full details of experience, age and salary required, to Box EX 654, FOUNDRY TRADE JOURNAL.

ASSISTANT PLANT METALLURGIST

WITH Iron and Steel Melting Furnace experience, for control of Hot Blast Cupolas and Electric Arc Furnace. Shift-work involved.

Qualifications—at least O.N.C. Salaried staff appointment, contributory Superannuation Scheme.

Details of qualifications, training, experience, etc., in writing to:

Personnel Manager,
LEY'S MALLEABLE CASTINGS CO., LTD.
Derby.

FOUNDRY FOREMAN required (Midlands area). Experienced Blackheart Malleable. First class opportunities of advancement for man with drive and initiative. Pension Scheme. Full sports and social facilities. Staff appointment. Write, giving full details of age and experience, together with salary required to Box FF608, FOUNDRY TRADE JOURNAL.

SMALL IRON FOUNDRY in country district of North Staffordshire require a first-class Jobbing Iron Moulder preferably with Pump experience up to 2 tons. Works house—Modern—3 Bedrooms—available for right man. Age immaterial. Fullest details of experience in confidence. Write Box SM603, FOUNDRY TRADE JOURNAL.

FOUNDRY SUPERINTENDENT required for modern jobbing foundry situated in Gloucestershire producing medium size grey and high duty iron engineering castings up to 2 tons in green sand and CO_2. Excellent prospects for the right man but only first class foundryman capable of directing all operations on the shop floor should apply, stating age, experience, and salary required to Box FS609, FOUNDRY TRADE JOURNAL.

FOUNDRY METHODS ENGINEER.

REQUIRED for Foundry Division of a North Midland Engineering Company. Production consists of a range of ordinary and alloy Irons, both machine and floor moulded, and thorough knowledge of this field is required.

A knowledge of Steel casting methods for medium weight machine and floor moulded castings is also essential.

Additionally the selected candidate will be expected to co-operate closely with the rest of the Foundry Executives.

This is an interesting and challenging post, and should suit a young and energetic man, with a suitable technical background, which could be metallurgical, Foundry College or apprentice trained.

Please state details of experience and some indication of salary requirements to: FOUNDRY DIRECTOR, Box FM 652, FOUNDRY TRADE JOURNAL.

SITUATIONS VACANT—*contd.*

GENERAL MANAGER required for Mechanised Foundry in the Black Country. The foundry includes a fully Mechanised Plant for sand moulding castings up to 20 lbs. supplemented by Shell Moulding Machines. Knowledge of Pattern Shop and Maintenance Fitting Shop practice required. Salary £1,500 p.a. with use of works car. Box GM660, FOUNDRY TRADE JOURNAL.

FOUNDRYMAN required by old established Engineering firm in East Anglia; pleasantly situated in small country town within a few miles of the sea. The successful applicant will be required to take control of the Iron Foundry and to be responsible for estimating, fixing piece work prices, quality of metal and production. Please apply in writing, quoting age, experience and salary required, to the ASSISTANT GENERAL MANAGER, Box FR659, FOUNDRY TRADE JOURNAL.

AGENTS

MANUFACTURERS AGENT. Well-connected in the Midlands foundries requires further Agency, on commission basis. Box MA634, FOUNDRY TRADE JOURNAL.

MACHINERY WANTED

WANTED.—20 Ton E.O.T. Crane, approx. 44 ft. span, compressor 300 C.F.M. Box WA612, FOUNDRY TRADE JOURNAL.

WANTED.—One Overband Magnet. One Pig Breaking Machine. Full particulars and prices to Box WA656, FOUNDRY TRADE JOURNAL.

WANTED

MOULDING M/cs: HPL1 and 2. Titan 75-lb. Core Blower.
Redford Bench Type ditto.
Fordath Core Sand Mixer, 5-10 cwt.
Sand Mills, 3 ft. 6 in. to 5 ft. dia.
Box WM655, FOUNDRY TRADE JOURNAL.

WANTED, very cheaply, motorised (400/3/50) D/E 16 in. Grinder. Any make if cheap. Also Old Shot Blast Airless Plant for small foundry. Box WV653, FOUNDRY TRADE JOURNAL.

MOULDING BOXES required—tops, bottoms and middles—sizes from 4 ft. × 4 ft. up to 8 ft. × 7 ft. Also top parts, 15 ft. × 10 ft. and 12 ft. × 12 ft. Cast Iron or Steel, good condition. Reply to: DUDLEY FOUNDRY CO., LTD., Moor Lane, Brierley Hill.

WANTED — TENSILE TESTING MACHINE. Accurate registering machine with capacity up to 7 ton loads. In good condition. Box WA656, FOUNDRY TRADE JOURNAL.

WANTED. Ladle for steel. Capacity 12/20 tons. With or without mechanical tipping gear. Bottom pouring gear an advantage. Box WL638, FOUNDRY TRADE JOURNAL.

REQUIRED. One Osborn Jolt Ram Roll-over Moulding Machine, size No. 502. State price and where can be inspected. WILLEY & Co. LTD., Water Lane, Exeter.

MACHINERY FOR SALE

UNUSED "MARTONAIR" Horizontal Pneumatic Cable Hoists. 300 lbs. capacity, 100 lbs. working pressure. Four-wheel articulated suspension trolley. Pendant control. £15 each. Box UM663, FOUNDRY TRADE JOURNAL.

MACHINERY FOR SALE—*contd.*

TWW

LINSLADE No. 1 Automatic Sand Rammer, cap. approx. 600 lb. rammed sand per min. Maximum radius 10 ft. With electrics wound for 400/3/50 cycles supply.

New Guyson Shot Blast Cabinet, 42 in. × 30 in. × 36 in. Complete with Dust Collector and Extraction Unit. With electrics wound for 400/440/3/50 cycles supply.

Three secondhand Morris type "M" Screenarators, motorised for 400/3/50 cycles supply.

Wallwork type 562AY Turnover Moulding Machine, load 300 lb., pattern draw 8½ in., table size 22½ in. × 17½ in.

Coleman Wallwork type CN. Jolt Squeeze Ram Pattern Draw Moulding Machine, load 600 lb., pattern draw 10 in.; suitable for boxes 20 in. × 20 in. or 25 in. × 12 in.

Shot Blast Plant, Rumbling Barrels, Furnaces, Air Compressors, available from stock.

THOS W. WARD LTD.
ALBION WORKS : SHEFFIELD
'Phone : 26311 'Grams : "Forward"

Remember Words might have it!

ONE Water Cooled Compressor with Receiver and Switchboard and Automatic Cut-out. One 10 cwt. Cupolette, complete with Blower and Platform. Very good condition. One Black Seam Brass Furnace, 150 lb. capacity, coke fired. Variety of Moulding Boxes. Apply: CITY CASTINGS (LINCOLN), LTD., Doddington Road, Lincoln. Tel. No. 24279.

BRAYSHAW Gas Fired Bale Out Melting Furnace. Capacity 400 lbs. Working temperature 1,000 deg. C. Complete with all gas and air connections, control valves, etc., etc., and "Foster" temperature indicator and regulator. Condition second-hand, unused. WHITEFIELD MACHINERY & PLANT, LIMITED, 48, Chatham Street, Stockport, Cheshire. Telephone number: Stockport 4471.

SPECIAL OFFER—
THE FOLLOWING PRACTICALLY NEW EQUIPMENT FOR SALE AT BARGAIN PRICES.

Pneulec 2-ton capacity Balanced Blast Cupola.
Three small Cupolettes.
Pneulec motorised Sand Disintegrator.
Spermolin 2-cwt. capacity Motorised Sand Mixing Machine.
Fordath, Rotoil No. 4 motorised Sand Mixing Machine.
MacNab jolt squeeze Moulding Machine.
New and unused drawer-type Core Ovens, by Alldays & Onions, oil fired.
New Bale-out and Lift-out Furnaces. Leaflet and photograph available.
New Polford 600 lb. capacity Coke Fired Furnace.
Morgan 600 lb. capacity Coke Fired Tilting Furnace.
Large stock of Ladles up to 10-tons capacity. Please send for list.
Fordath motorised Rotary Core Making Machine.
Pneulec Sand Mixing Machine.
Large size Adaptable hand Moulding Machine.
Full details on request from:

ELECTROGENERATORS LTD.
AUSTRALIA ROAD, SLOUGH, BUCKS.
Telephone. SLOUGH 22877 & 22094

MACHINERY FOR SALE—*contd.*

Roper
LADLES
STOCK UP TO 5TON CAP.
E. A. ROPER & CO. LTD.
KEIGHLEY · Phone: 4215-6

PNEULEC 6 ft. dia. Single Roller Muller and Stirrer, Bucket Loader and Disintegrator, enclosed motor drive, O.I. Starter.
Devey 5 ft. dia. Sand Mill, overdriven.
Green 4 ft. dia. Ditto, underdriven.
Foundry Ladles, various sizes.
Morgan 15-cwt. capacity Type C.A. Tilting Furnace with Burner, Fan, Oil Pump and Heater, Welded Fuel Tank, etc.
Cupolettes, Blowing Fans, Air Compressors.
Send your enquiries to:

S. C. BILSBY & CO.,
Hainge Road, Tividale, Tipton, Staffs.
'Phone: Tipton 2448.

FOR SALE.—Approximately 1,000 steel box parts, double lugs, sizes 17½ in. × 13 in. × 6 in. and 15 in. × 12 in. × 6 in. Surplus to requirements at very cheap price. Box FS648, FOUNDRY TRADE JOURNAL.

ACME CORE STOVE FOR SALE.

ACME Gas-Heated Two Loop Continuous Vertical Core Drying Stove, about 16 ft. × 9 ft. × 6 ft. × 27 ft. 7 in. high, with Electrically Operated Automatic Loading and Unloading Device, working in conjunction with Parker-Mitchell Electrically-driven Continuous Pendulum Chain Conveyor, about 240 ft. long, having 43 trays, 7 ft. 6 in. × 2 in.; also Parker Mitchell Overhead Travelling Electric Hoist Block and Runway, with 3½ cwt. Bottom Discharge Bucket. The electrical equipment is for A.C. three-phase 50-period 440 volt supply, with Dewhurst and Igranic Contactor Control Panels. For further particulars and appointment to view please reply to:

MESSRS. WEIR FOUNDRIES, LTD.,
Pontefract Lane, Leeds, 9.

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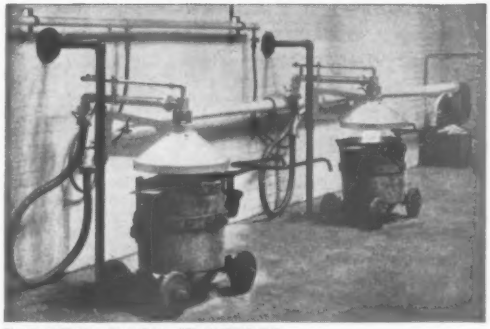

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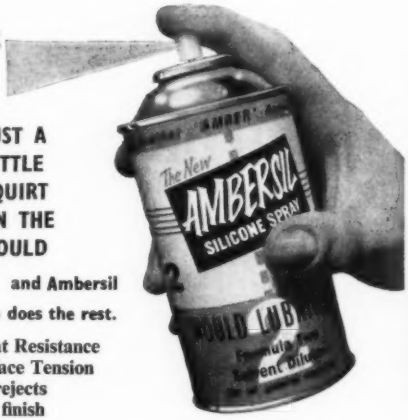

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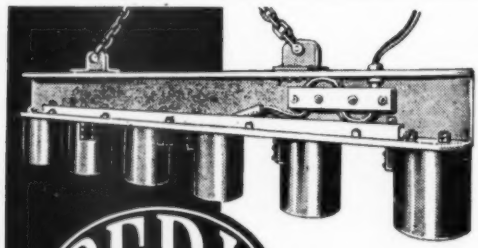

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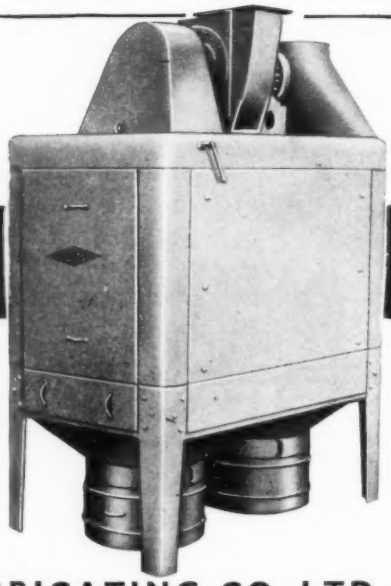

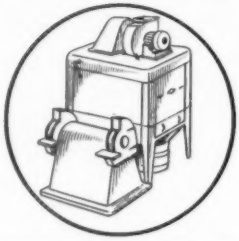

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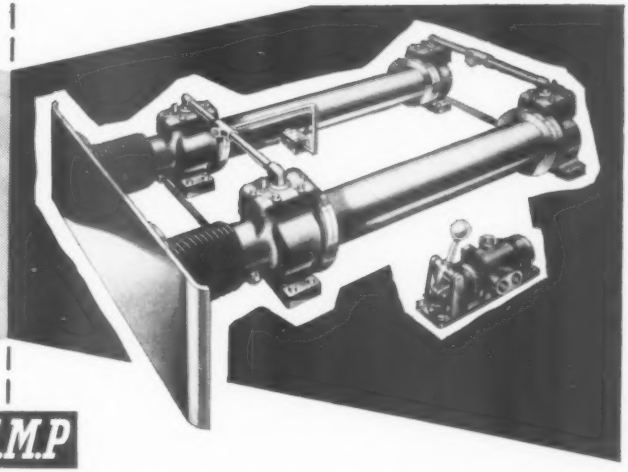

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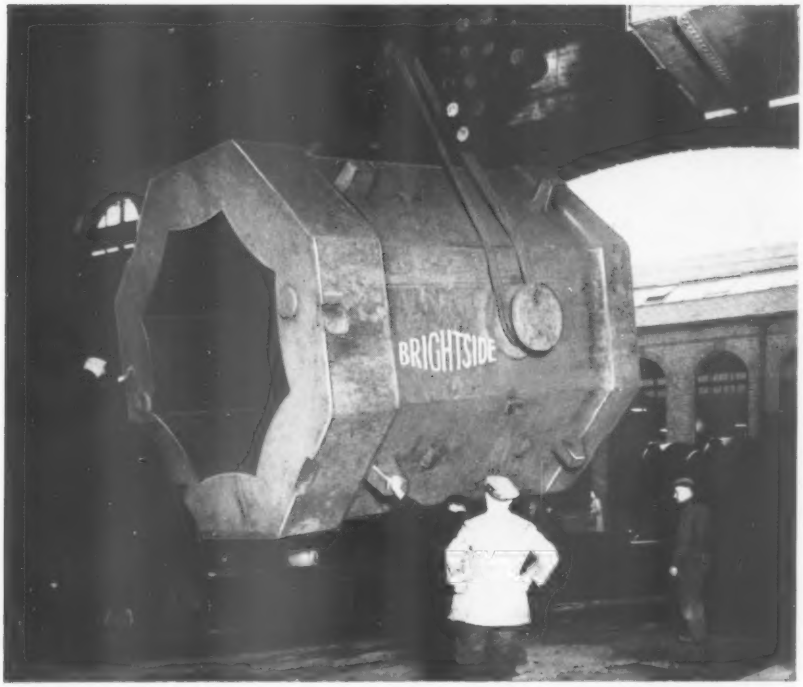

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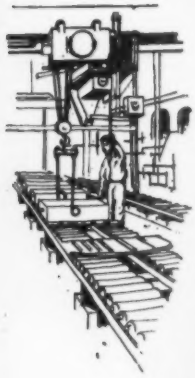

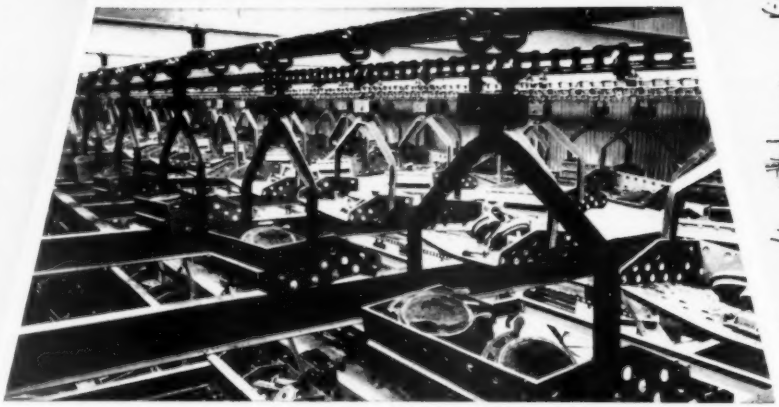

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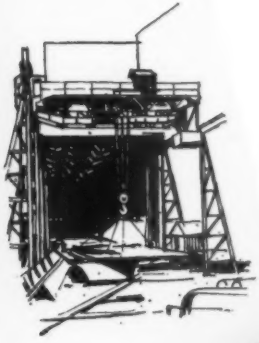

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